c/c 96000435
(cont.)

# X Collection

## INDEX

Page: 1

| Barcode Number | Box Number | Total of Volumes | Call Number |
|---|---|---|---|
| LIBRARY OF CONGRESS 0 029 767 262 9 | 1796 | 8 | QD45–QD315 |
| LIBRARY OF CONGRESS 0 029 767 263 0 | 1797 | 61 | QD455.S3–QD901.I5 |
| LIBRARY OF CONGRESS 0 029 767 264 2 | 1798 | 11 | QE1.D4–QE1.S23 no. 1 in oversize box |
| | 1799 | 6 | QE35–QE78.5.SC |
| LIBRARY OF CONGRESS 0 029 767 265 4 | 1800 | 15 | QE125.Z9–QE817.08 |
| LIBRARY OF CONGRESS 0 029 767 266 6 | 1801 | 11 | QH48–QH307 |
| LIBRARY OF CONGRESS 0 029 767 267 8 | 1802 | 13 | QH345–QH471 |
| | 1803 | 10 | QK3.M3–QK13 |

1800X

1800X

# X Collection

## INDEX

Page: 2

| Barcode Number | Box Number | Total of Volumes | Call Number |
|---|---|---|---|
| LIBRARY OF CONGRESS 0 029 767 268 A | 1804 | 9 | QK 31.B2 no. 1-9 -Undated- |
| LIBRARY OF CONGRESS 0 029 767 269 1 | 1805 | 98 | QK31.F8 no. 86 in oversize box QL31.S4 |
| | 1806 | 4 | QK49- QK495 |
| LIBRARY OF CONGRESS 0 029 767 270 8 | 1807 | 57 | QL3.M2- QL31.K2 |
| | 1808 | 23 | QL31.N3- QL31.R6 |
| LIBRARY OF CONGRESS 0 029 767 271 A | 1809 A | 15 | QL49.Z9 no. 1-15 (1939- Undated) |
| LIBRARY OF CONGRESS 0 029 767 272 1 | 1809 B | 3 | QL49.Z9 no. 16-18 (Undated) |
| | | | |

Box

X-QK 31
·F8 #1

Reprinted from THE BRYOLOGIST, Vol. XXXV, July–September–November 1932.

# RECENT LITERATURE ON MOSSES

M. FULFORD

ARCHIE, D. H. Exploring the Sphagnum bog. Flower Grower **19:** 92–94. 1932.

AMANN, J. Étude des mousses au microscope polarisant. Ann. Bryol. **4:** 1–48. 4 fig. 1 pl. 1931.

BROTHERUS, V. F. Neue exotische Laubmoose. Mitt. Inst. f. Allgem. Bot. Hamburg **8:** 399–406. 7 fig. 1931.

BRÜHL, P. A census of Indian Mosses with Analytical keys to genera in the census as well as all the genera dealt with in the 2nd edition of Prof. Brotherus' account of Musci Veri in Engler and Prantl's Pflanzenfamilien. Records Bot. Survey India **13:** 1–152. 1931.

BLATTER, E. and J. FERNANDEZ. Waziristan Mosses, with some new species described by H. N. Dixon. Jour. Indian Bot. Soc. **10:** 145–153. 1931.

BARTRAM, EDWIN B. Mosses of Raiatea, Society Islands. Bernice P. Bishop Mus. Occas. Papers. **9:** No. 16: 3–14. 4 fig. 1931.

BURRELL, W. H. Tomentum on perichaetial bracts of *Leucobryum*. Rev. Bryol. **4:** 86–87. 1931.

BOWEN, E. J. Water conditions in *Polytrichum commune*. Ann. of Bot. **45:** 175–200. 1 pl. 7 fig. 1931.

BLAIKLEY, NELLIE M. Absorption and conduction of water and transpiration in *Polytrichum commune*. Ann. of Bot. **46:** 289–300. 4 fig. 1932.

DOUIN, CH. Les Initiales secondaires chez les Muscinées. Rev. Bryologique **4:** 5–16. 1 pl. 1931.

LEACH, W. On the importance of some mosses as pioneers on unstable soils. Jour. of Ecol. **19:** 98–102. 2 pl. 1931.

LORCH, WILHELM. Anatomie der Laubmoose. Handbuch d. Pflanzenanatomie. II. Bryophyten VII/1. 358 pp. 230 fig. 1931.

MALTA, N. Übersicht der Moosflora des ostbaltischen Gebietes. II Laubmoose. Acta Horti Bot. Univ. Latviensis **5:** 75–184. 19 fig. 1930.

MÖLLER, H. Lövmossornas utbredning i Sverig. XI Grimmiaceae. Arkiv. f. Bot. 24 A. nr. 2. 177 S. 28 fig. 1931.

MONTGOMERY, CH. E. Ecology of the Mosses of Grand de Tour region of Illinois, with special reference to pH relation. Bot. Gazette **91:** 225–251. 1931.

NICHOLSON, W. E. Hybridity among the Bryophytes. Rev. Bryol. **4:** 138–140. 1931.

PITMAN, E. M. Additional Mosses from the vicinity of Winthrop, Maine. Maine Nat. IX. p. 132. 1929.

POTIER DE LA VARDE, R. Max Fleischer (1861–1930). Ann. de Cryptogamie exotique **3:** 161–167. 1930.

POTIER DE LA VARDE, R. Revision des traveux parus jusqu'en 1928 sur la flore cryptogamique africaine. IV. Mousses. Liste additive. Annal. Cryptog. exotique **3:** 106–108. 1930.

X-QK 31
.F8 #2

Reprinted from THE BRYOLOGIST, Vol. XXXV July–September–November 1932.

## RECENT LITERATURE ON HEPATICS

M. FULFORD

ALLEN, CHARLES E. Sex-inheritance and sex-determination. Amer. Nat. 66 (**703**): 97–107. 1932.

ALLORGE, PIERRE. Trois Muscinées nouvelles pour les Pyrénées. Bull. Soc. Bot. France **78**: 437–438. 1931.

ANDERSON, E. N. Discharge of sperms in *Marchantia domingensis* Bot. Gaz. **92**: 66–84, 19 fig. 1931.

BELTRAN, BIGORRA. Adiciones a las muscíneas de la Provincia de Castellón. Mem. Real. Soc. Espan. Histor. Natur. **16**: 275–284.

BERGDOLT, ERNST. Die Marchantiaceae *Pellolepis* Lindb., *Sauteria* (Nees.) Lindb. und *Clevea* Lindb. Die Pflanzenreale, 3 Reihe, Heft **5**: 55–57. Karte 46–48. 1932.

BIZOT, MAURICE. Contribution à la Flore bryologique de la Côte d'Or. Rev. Bryol. **4**: 17–31. (29 hepatics). 1931.

BORNMULLER, I. Zur bryophyten Flora Kleinasiens. Magyar. Bot. Lapok. 1931. 1–21. (21 hepatics).

CARL, HELMUT. Beiträge zur Kenntnis der Lebermoosgattungen *Syzygiella* Spruce und *Jamesoniella* Spruce. Hedwigia **71**: 283–304. 11 fig. 1931.

CARL HELMUT, Die Arttypen und die systematische Gliederung der Gattung *Plagiochila*. Ann. Bryologici. Suppl. 2: VIII + 170. 13 fig. 1931. [*See* review, p. 00]

X-QK 31
·F8 #

Reprinted from THE BRYOLOGIST, Vol. XXXVI, January–March–May–July, 1933.

# RECENT LITERATURE ON HEPATICS

M. FULFORD

CHALAUD, G. Sur la place en systematique de *Fossombronia Fleischeri* Osterw. Verhandl. Bot. Ver. Prov. Brandenburg **72:** 69–75. 1 pl. 1930.

CHALAUD, G. Qu'est-ce que le périgyne des Hépatiques? Rev. Gen. Bot. **41:** 348. 3 fig. 1929.

DISMIER, G. Flora bryologique de la région de Plombiers. Bull. Soc. Naturalists Ain. **46:** 104–110. 1932.

DOUIN, CH. Les Initials secondaries chez les Muscinées. Rev. Bryologique **4:** 5–16. 1 pl. 1931.

DU RIETZ, E. G. Zur Vegetationsökologié der ostschwedischen Küstenfelsen. Drude-Festschr. Beih. Bot. Centralbl. **49** (Ergänzungs band) 61–112. 1932.

FÖRSTER, KARL. Die Entwicklung untergetauchter Pflanzen von Marchantia unter verschiedenen Aussenbedingungen. Planta **16:** 332–351. 7 figs. 1932.

HILLIER, LOUIS. Aperçu bryologique sur la forêt de la Serre (Jura). Rev. Bryol. **4:** 123–134. 1931.

HORIKAWA, Y. Die epiphyllen Lebermoose von Japan. Bot. Magazine Tokyo **46:** 176–187. 1 pl. 1932.

HORIKAWA, Y. Studies on Hepaticae of Japan VI. Jour. of Sci. Hiroshima Univ. Series B. Div. 2, **1:** 77–94. 17 fig. 2 pl. 1932.

HORIKAWA, Y. Studies on Hepaticae of Japan VII. Jour. Sci. Hiroshima Univ. Ser. B. Div. 2, **1:** 121–134. 9 figs. 3 pl. 1932.

MEYER, K. I. Zur Entwicklungsgeschichte der Sporophyten einiger Marchantiales. Planta **13:** 193–209. 33 fig. 1931.

ORTH, R. Vergleichende Untersuchungen Über die Luftkammerentwicklung der Ricciaceen. Flora **25:** 232–259. 10 fig. 1931.

PAGAN, F. M. Morphology of the sporophyte of *Riccia crystallina*. Bot. Gaz. **93:** 71–84. 24 fig. 1932.

PAPP, C. Contributions à la systematique des Bryophytes de la Moldavie, suivie de quelques considerations bryologeographiques. Annal. Scient. Univ. Jassy **17:** 217–227, 1 fig. 1931.

PAUL, H., W. MÖNKEMEYER AND V. SCHIFFNER. Bryophyta (Sphagnales-Bryales-Hepaticae) in Pascher: Die Süsswasserflora Mitteleuropas. 2nd Edit. Heft **14** (2). 1931.

PEARSON, W. H. Notes on a collection of Hepaticae from Jamaica. F. O. Bower 1909. Ann Bryol. **4:** 95–112. 2 pl. 1931.

RABINOVITZ-SERENI D. Contributio alla Bryologia della Palestina. Ann. di Bot. (Torino-Roma) **19:** 333–339. 1931.

REIMERS, H. Die Vegetation, insbesondere die Moosvegetation. (Das Natürschutzgebiet Schildow.) Neudamm. u. Berlin (J. Neumann) 14–19. 1931.

REIMERS, H. Ein Beitrag zur Moosflora von Korea. Hedwigia **70:** 359–372. 4 fig. 1931.

X-QK 31
.F8 #4

(over)

#4

Reprinted from THE BRYOLOGIST, Vol. XXXVI, January–March–May–July, 1933.

## RECENT LITERATURE ON MOSSES

M. FULFORD

ALLORGE, PIERRE. Notes sur la flore bryologique de la Péninsule Ibérique. VIII. Additions à la flore portugaise. Rev. Bryol. **4:** 32–36. 1931. (14 sp. new to Portugal.)

ALLORGE, P. AND R. GAUME. Nouvelles localités du *Sphagnum medium* Limpr. dans la région parisienne. Rev. Bryol. **4:** 90–92. 1931.

ARMITAGE, ELEANORE. Some Bryophytes from the Azores. Journal of Bot. **69:** 75–76. 1931.

BARTRAM, E. B. A review of the American species of Daltonia. Bull. Torrey Bot. Club **58:** 31–48. 2 pl. 1931.

BEARDSLEY, MARTHA. The Cytology of *Funaria flavicans* Michx. with special reference to fertilization. Ann. Mo. Bot. Garden **18:** 509–546. 3 pl. 1931.

BECQUEREL, PAUL. La vie latente des spores des Mousses aux basses températures. Compt. Rend. Acad. Sci. Paris **194:** 1378–1380. 1932.

BLIZZARD, A. W. Plant sociology and vegetational change on High Hill, Long Island, N. Y. Ecology **12:** 208–231. 1931.

CAMBAGE, R. H. The origin and development of portions of the Australian Flora. Rept. Australasian Assoc. Adv. Sci. **19:** 1–29. 1928 (1929).

DAHLGREN, K. V. O. Mossornas utveckling (Die Entwicklung der Moose). Naturens liv. i. ord och bild, Stockholm **54:** 743–751. 23 fig. 1931.

DENING, KARL. Entwicklungsgeschichtliche Untersuchungen am Gametophyten von Buxbaumia aphylla L. Verhandl. Naturhist. Ver. Preuss. Rheinlande u. Westfalens **85:** 306–444. 52 fig. 1 map. 1 pl. 1928 (1929).

X-QK 31
.F8

Reprinted from THE BRYOLOGIST, Vol. XXXVI, November, 1933.

# RECENT LITERATURE ON MOSSES

M. FULFORD

ALLORGE, P. Trois muscinées nouveaux pour les Pyrénées. Bull. Soc. Bot. France **78**: 437–438. 1931.

ALLORGE, P Sur quelques types de disjonctions dans la flore musinale ibérique. Rec. Trav. Cryptog. dédiés à Louis Mangin. Paris 1931. 465–475. 4 maps. 1931.

ALLORGE, P. et J. THÉRIOT. Orthodomtium Gaumei sp. nov. Rev. Bryol. **4**: 194–196. 1 pl. 1931.

AMANN, J. Excursion bryologique. Les Haudéres-Arolla July 21–23. 1931. Bull. Murithienne **49**: 18–24. 1931–32.

AMANN, J. Bryométrie. Etude statisque de l'indice cellulaire chez les Mousses. Bull. Soc. Vaud. Sci. Nat. **57**: 413–476. 6 figs. 1932.

ANDRES, H. Beiträge zur Bryogeographie des Vereinsgebietes. Sitzungsber. Naturh. Vereins preussisch. Rheinl. u. Westfalen 1930–1931. D. 21–24. (1932).

ANDRES, H. Beiträge zur Moosflora des südlichen Westfalens I. Abhandl. Westfäl. Prov. Museum f. Naturkunde **3**: 5–7. 1932.

ARWIDSSON, Th. Riccia Beyrichiana funnen i Åsele lappmark. Bot. Notiser Lund. 1932. 373–380.

BARTRAM, ED. B. Mosses of Northern Guatemala and British Honduras. Jour. Wash. Acad. Sci. **22**: 476–482. 1932.

BIZOT, M. Contribution à la flore bryologique de la Côte d'Or Rev. Bryol. **4**: 17–31. 1931.

BIZOT, M. et G. GARDET. Muscinées du Plateau lorrain. Bull. Soc. Sci. Nancy 1931. 21 pp. 1931.

BUCH, H. Några anmärkningsvärda fanerogam-och mossfynd. Mem. Soc. pro Fauna et Flora Fenn. **5**: 78–79. 1928–1929 (1930).

CARDOT, J. Le peuplement bryologique des îles britaniques. Soc. Biogèogr. III: 150–161. 1930.

CONARD, H. S. and B. O. WOLDEN. A key to the mosses of the Okoboji region. Univ. of Iowa Stud. Nat. Hist. 14, no. 7. 1932. (Includes hepatics.)

DIXON, H. N. African mosses collected by O. A. Hoeg. Kg. Norske Vidensk. Selsk. Skrifter 1932. No. 4, 27 pp. 9 fig. 1932.

DIXON, H. N. On the moss flora of Siam. Jour. Siam. Soc. Nat. Hist. Suppl. **9**: 1–51. 1932.

DIXON, H. N. Contributions to Japanese Bryology. I. Brachytheciaceae. Rev. Bryol. **4**: 153–169. 1931.

DIXON, H. N. Proposals on bryological nomenclature. Rev. Bryol. **4**: 119–122. 1931.

DIXON, H. N. and W. GREENWOOD. The mosses of Fiji. Proceedings of the Linnean Soc. N. S. Wales **55**: 261–302. 2 pl. 1931.

X-QK 31
.F8

Reprinted from THE BRYOLOGIST, Vol. XXXVII, January–February, 1931.

## RECENT LITERATURE ON HEPATICS

M. FULFORD

CHALAUD, G. La spermatogénèse chez Lunularia cruciata (L.) Dumor. Trav. Cryptogam. Paris, 1931. 113–126. 2 pl.

CHALAUD, G. Germination des spores et formation du gamétophyte chez Lophocolea cuspidata et Chiloscyphus polyanthus. Ann. Bryol. **4:** 49–78. 4 fig. 1931.

DICKSON, HUGH. Polarity and the production of adventitious growing points in Marchantia polymorpha. Ann. of Bot. **46:** 683–701. 1 pl. 31 fig. 1932.

EVANS, A. W. A new Plagiochasma from Texas. Amer. Jour. of Bot. **19:** 627–631. 7 fig. 1932.

GARAVANI, ERMINIO MIGLIORATO. Le Epatiche inedite "Rhizocephala" e "Riccia trichophylla" di Guglielmo Gasparrini. Atti Ist. Bot. Laborat. Crittog. Ital., III, 4: 153–155. 1930–32.

HAUPT, G. Beiträge zur Zytologie der Gattung Marchantia L. I. Zeitschr. f. indukt. Abstammungs-und Vererbungslehre **62:** 367–428. 1 pl. 44 fig. 1932.

HERZOG, TH. Beiträge zur Kenntnis der Gattung Plagiochila. I. Neotropische Arten. Hedwigia **72:** 195–242. 22 figs. 1932.

5
Copy

X-UK 31
.F8 #7

Reprinted from THE BRYOLOGIST, Vol. XXXVII, March–April, 1934.

# RECENT LITERATURE ON HEPATICS

M. FULFORD

ALLORGE, P. Le Jubula Hutschinsiae Dum. à la Rhune (Basses-Pyrénées). Rev. Bryol. et Lichén. **5:** 48–49. 1932.

BROCKSMIT, T. Een en ander over het Geslacht Madotheca. Nederl. Kruidk. Arch. **1:** 97–102. 1 pl. 1929.

BUCH, H. Morphologie und Anatomie der Hepaticae. In Verdoorn, Fr. Manual Bryol. Chapt. 2. The Hague. 1932.

BUCH, H. Experimentelle Morphologie. In Verdoorn, Fr. Man. Bryol. Chapt. 3. The Hague. 1932.

BUCH, H. Bryophyta nova. 10. Lophozia gracillima Buch sp. nov. Ann Bryol. **6:** 129–131. fig. 6–13, p. 126 & fig. 4–6, p. 129. 1933.

BUCH, H. Bryophyta nova. 9. Lophozia silvicola Buch sp. nov. Ann. Bryol. **6:** 125–129. fig. 1–5, p. 126 & fig. 1–3, p. 129. 1933.

BUCH, H. Vorarbeiten zu einer Lebermoosflora Fenno-Scandias. 1. Ein Versuch zur Aufteilung der Gattungen Lophozia Dum. und Sphenolobus Steph. Mem. Soc. Fauna et Flora Fennica 8. 1931–1932.

BUCH, H. Experimentelle-systematische Untersuchungen über die Lophozia ventricosa-gruppe. Ann. Bryol. **6:** 7–14. 7 fig. 1933.

CARL, HELMUT. Über die blattbürtigen Brutsprösschen bei Plagiochila. Ann. Bryol. **6:** 15–19. 2 fig. 1933.

CHALAUD, G. Germination des spores et phase protonémique. In Verdoorn, Fr. Man. Bryol. Chapt. 4. The Hague. 1932.

DOUIN, CH. L'involucre de l'Anthoceros. Ann. Bryol. **6:** 38–45. 16 fig. 1933.

DOUIN, CH. Le développement basilaire de l'archégone. Rev. Bryol. et Lichén. **5:** 111–130. 1 pl. 1933.

GAMS, H. Quarternary distribution. In Verdoorn, Fr. Man. Bryol. Chapt. 11. The Hague. 1932.

GARJEANNE, A. J. M. Physiology. In Verdoorn, Fr. Man. Bryol. Chapt. 8. The Hague. 1932.

HAUPT, GERTRAUD. Beiträge zur Zytologie der Gattung Marchantia (L.) I. Zeitschr. f. induct. Abstammungs- und Vererbungslehre **62:** 367–428. 1 pl. 44 fig. 1932.

HAUPT, GERTRAUD. Beiträge zur Zytologie der Gattung Marchantia (L). II. Zeitschrift für inductive Abstammungs- und Vererbungslehre **63:** 390–419. 19 fig. 1 pl. 1933.

HERZOG, TH. Beiträge zur Kenntnis von Neurolejeunea. Ann. Bryol. **6:** 46–58. 6 fig. 1933.

HERZOG, TH. Geographie. In Verdoorn, Fr. Man. Bryol. Chapt. 10. The Hague. 1932.

HORIKAWA, Y. Two new species of Schistochila from Formosa. Ann Bryol. **6:** 59–61. 2 fig. 1933.

QHR 311
.F8 #8

Reprinted from THE BRYOLOGIST, Vol. XXXVII, SEPTEMBER–OCTOBER, 1934.

# RECENT LITERATURE ON HEPATICS

M. FULFORD

ARSÈNE, G. Hepatiques du Noveau-Mexique (U. S. A.) déterminées par Miss Caroline Coventry Haynes. Ann. Crypt. Exot. **6:** 150–160. 1933.

BRINKMAN, A. H. List of Hepatics of Pacific Coast and adjoining Territory. Prov. Brit. Columbia, Report of the Provincial Museum of Natural History. 1933. pp. 24–33. 1934.

BRITISH BRYOLOGICAL SOCIETY REPORT 3. pt. 2. pp. 87–174. 1933.

EFTIMIOU, M. P. Sur la spermatogénèse chez Bucegia Romanica Radian. Botaniste **25:** 117–136. 3 fig. 1 pl. 1933.

EVANS, A. W. The thallose Hepaticae of the Juan Fernandez Islands. In Skottsberg, C. The Natural History of Juan Fernandez and Easter Island **2:** 551–586. 6 fig. 1930.

EVANS, A. W. Some representative species of Bazzania from Sumatra. Papers of the Michigan Acad. Sci., Arts, and Letters **17:** 69–118. 6 pl. 1932 (1933).

EVANS, A. W. A Revision of the genus Acromastigum. Ann. Bryol. Suppl. III. VII + 178. 40 fig. 1934.

FLORIN, R. Några marchantiacefynd i nordvästra Härjedalen och Torne Lappmark. Svensk Bot. Tidskr. **25:** 438–439. 1931.

FLORIN, R. Asterella Lindbergiana (Corda) Lindb. funnen i Jämtland. Svensk Bot. Tidskr. **26:** p. 462. 1932.

GRIGGS, R. F. and DANIEL READY. Growth of Liverworts from Katmai in nitrogen-free media. Amer. Jour. Bot. **21:** 265–277. 1 fig. 1934.

GUILLAUMOT ABBÉ. Hépatiques rares de la flore française. Rev. Bryol. et Lichén. **6:** p. 201. 1933.

HILLIER, L. et M. BIZOT. Blyttia Lyellii (Hook.) Lindb. dans le département du Jura. Rev. Bryol. et Lichén. **6:** 205–206. 1933.

HORIKAWA, Y. Some liverworts like the moss in appearance. Journ. Japan. Bot. **8:** 314–318. 6 fig. 1932. Japanese.

HORIKAWA, Y. Studies on the Hepaticae of Japan VIII. Journ. Sci. Hiroshima Univ. **1:** 197–204. 4 fig. 1 pl. 1933.

KHANNA, L. P. A new Anthoceros from Burma. Journ. Bot. **71:** 125–127. 6 fig. 1933.

KOBENDZA, R. et J. Motyka. La végetátion des éboulis des Monts de S-te Croix. Bull. Int. Acad. Pol. Sci. et Let. July, 1929. pp. 175–207. 1930.

X-QK 31
.F8 #

Reprinted from THE BRYOLOGIST, Vol. XXXVII, November-December, 1934.

## RECENT LITERATURE ON MOSSES

M. FULFORD

ANDREWS, A. LEROY. What is Sphagnum Americanum? Ann. Bryol. **6:** 1–6. 1933.

BARTRAM, EDWIN B. Manual of Hawaiian Mosses. Bernice P. Bishop Museum Bull. 101. pp. 1–275. 194 fig. 1933.

BARTRAM, EDWIN B. Mosses of northern New Mexico collected by Br. Arsène. Ann. Crypt. Exot. **4:** 153–160. 1931.

BIZOT, MAURICE. Habrodon perpusillus (de Not.) Lindb. dans le Jura. Rev. Bryol. et Lichén. **5:** p. 47. 1932.

BLUMRICH, J. Bemerkenswerte Moose in Feldmoos. Heimat, Vorarlberger Monatshefte **14:** 130–131. 1933.

BORNMÜLLER, J. Ein kleiner Beitrag zur Moosflora des östlichen Tirols und angrenzenden Vorarlbergs. Mitt. Thüring. Bot. Ver. **41:** 33–38. 1933.

BRITISH BRYOLOGICAL SOCIETY. Report for 1932. Vol. III. pt. I. 1933.

BROTHERUS, V. F. Neue exotische Laubmoose. (Posthumous work.) Mitt. Inst. f. allgen. Bot. Hamburg **8:** 309–406. 7 fig. 1931.

BROTHERUS, V. F. und L. I. SAVICZ. Verzeichnis von A. A. Elenkin in Jahre 1902 in den Sajanen und der Mongolei gesammelten Moose. Germ. summary. Bull. Jard. Bot. Acad. Sc. U. R. S. S. **30:** 81–96. 1932.

BURGES, ALAN. Notes on the Mosses of New South Wales. I: Additional records and description of a new species of Buxbaumia. Proc. Linn. Soc. N. S. Wales **57:** 239–244. 1 fig. 1932.

CASARES-GIL, Ant. Flora Iberica, Briofitas (Pt. 2) Musgos. Parte primera por A. Casares-Gil. 8 vo., pp. XXXX + 434, frontispiece & figs. 149. Musec. National de Ciencias Naturales. Madrid. 1932.

CORNET, A. Glanures bryologiques. Bull. Soc. R. Bot. Belgique **65:** 86–89. 1933.

CORY, V. L. A new Lesquerella from Western Texas—Lesquerella lepidota sp. nov. Rhodora **32:** 110. 1930.

DISMIER, G. Bryum canariense Brid., synonyme de Bryum provinciale Philib. et aperçu sur la distribution générale. Rev. Bryol. et Lichén. **5:** 46. 1932.

DISMIER, G. Note sur la présence du Tortula obtusifolia Schleich dans l'Oisans. Rev. Bryol. et Lichén. **5:** 47–48. 1932.

DIXON, H. N. Classification of Mosses. In Verdoorn, Fr. Man. Bryol. Chapt. 14. The Hague. 1932.

DIXON, H. N. New species of Clastobryeae from Indo-Malaya. Ann. Bryol. **6:** 31–37. 1933.

DIXON, H. N. Mosses collected on Mt. Cameroon by Miss M. Steele. Ann. Bryol. **6:** 20–30. 1933.

DIXON, H. N. Mosses of Hong Kong, with other Chinese Mosses. Hong Kong Nat. Suppl. 1933. 31 p. 2 pl. 1933.

DIXON, H. N. et R. POTIER DE LA VARDE. Nouvelle contribution à la Flore bryologique de l'Inde. Ann. Crypt. Exot. **3:** 168–193. 6 fig. 1930.

X-NM 81
.F8 [illegible]

Reprinted from THE BRYOLOGIST, Vol. XXXVIII, January–February, 1935.

# RECENT LITERATURE ON MOSSES

M. FULFORD

AMANN, J. Flore des mousses de la Suisse. Vol. III: Revision et additions. Beitr. Kryptogamenfl. Schweiz 7: 186 p. 22 fig. 1933.

5
Copy

X-OK 31
.F8 #1

Reprinted from THE BRYOLOGIST Vol. XXXVIII, May-June, 1935.

## RECENT LITERATURE ON MOSSES

M. FULFORD

ALBRECHT, J. H. Synopsis of the European species of Pogonatum and Polytrichum. Journ. Bot. **72:** 75–80. 2 fig. 1934.

ALLORGE, P. Contribution à la flore bryologique du Marco espagnol. Rev. Bryol. et Lichén. **6:** 206–208. 1933.

ARMITAGE, E. Bryophyta new to Co. Waterford. Journ. Bot. **72:** 18–20. 1934.

AARIO, L. Pflanzentopographische und palaeographische Mooruntersuchungen in N—Satakunta. Fennia **45:** 1–179. 16 pl. 8 maps. Helsingfors. 1932.

BARTRAM, EDWIN B. Mosses of the river Napo, Ecuador. Rev. Bryol. et Lichén. **6:** 9–18. 3 fig. 1933.

BARTRAM, EDWIN B. Mosses of the Templeton Croker Expedition collected by John Thomas Howell and Lists of the Mosses known from the Galapagos Islands and from Cocos Island. Proc. Acad. Sc. California **21:** 75–86. 3 fig. 1933.

BEAUMONT, A. B. Toxicity of Sodium nitrate for a species of moss. (Polytrichum commune). Science, N. S. **75:** 312–313. 1932.

BLAIKLEY, N. M. The transpiration of the sporophyte of Polytrichum commune. Ann. Bot. **46:** 1067–1068. 1932.

BOROS, A. Die Verbreitung von Anomodon rostratus in Ungarn. Folia Sarariensis. Feb., 25, 1934. pp. 6. Hungarian and German.

BOROS, A. A nyirseg floája es novenyfoldrajza. (The flora and vegetation of Nyirseg's). Publ. Commis. pour la Geogr. du. Pays natal. **7:** 207 p. Budapest 1932.

BÜRGENER, O. Weitere bryologische Beobachtungen aus Neu Vorpommern und Rügen. Dohrniana **12:** 13–18. 1933. Stettin.

COOPER, W. S. and H. FOOT. Reconstruction of a Late-Pleistocene Biotic Community in Minneapolis, Minn. Ecology **13:** 63–72. 4 fig. 1932.

CULMANN, P. Un flot de mousses atlantiques dans les Alpes françaises. Rev. Bryol. et Lichén. **6:** 78–89. 1933.

X-OK 31
·F8 #12

Reprinted from THE BRYOLOGIST, Vol. XXXVIII, September-October, 1935.

## RECENT LITERATURE ON MOSSES

M. FULFORD

BUCH, HANS. Methoden zur Herstellung Mikroskopischer Dauerpraeparate von Moosen unter Anwendung Wässeriger Einschlussmittel. Ann. Bryol. **7:** 6–8. 1934.

DIXON, H. N. Bryophyta nova. 19. Macromitrium elizabethae Dix. sp. nov. Ann. Bryol. **7:** 158. 1934.

DIXON, H. N. Bryophyta nova. 18. Splachnobryum arabicum Dix. sp. nov. Ann. Bryol. **7:** 157. 1934.

DIXON, H. N. Mosses of Celebes. Ann. Bryol. **7:** 19–36. 1934.

GAMS, H. Beiträge zur Kenntnis der Steppenmoose. Ann. Bryol. **7:** 37–56. 7 fig. 1934.

GROUT, A. J. Moss Flora of North America. Vol. II, part 1, 1–65. pls. 1–25. 1933; part 2, 67–138. pls. 26–57. 1935. Vol. III, part 1, 1–62. pls. 1–14. 1928; part 2, 63–114. pls. 15–29. 1931; part 3, 115–178. pls. 30–44. 1932;

QK 31
.F8 #13

Reprinted from THE BRYOLOGIST, Vol. XXXIX, January-April, 1936.

# RECENT LITERATURE ON HEPATICS

M. FULFORD

ALLEN, CHARLES E. The Occurrence of Polyploidy in Sphaerocarpcs. Amer. Jour. Bot. **22:** 664–680. 22 fig. 1 table. 1935.

BRINKMAN, A. H. Notes on Pacific Coast Hepatics. Prov. Brit. Columbia, Report of the Provincial Museum of Natural History 1934, p. 14. 1935.

CARTER, ANNETTA M. Riccia fluitans L.—a composite species. Bull. Torrey Bot. Club **62:** 33–42. 2 pl., 8 fig. 1935.

EVANS, A. W. Anatomy of the stem in the Lejeuneae. Bull. Torrey Bot. Club **62:** 187–214; 259–280. 8 fig. 1935.

HORIKAWA, Y. Monographia Hepaticarum Australi-Japanicarum. Jour. Sci. Hiroshima Univ. Ser. B. Div. 2. **2:** 101–325. 63 fig. 10 pl. 1934.

HORIKAWA, Y. Symbolae Florae Bryophytae Orientali-Asiae. IV. Bot. Mag. [Tokyo] **49:** 49–59. figs. 1–5. 1935.

HORIKAWA, Y. Symbolae Florae Bryophytae Orientali-Asiae. V. Bot. Mag. [Tokyo] **49:** 211–221. figs. 1, 2. 1935.

LANDER, CAROLINE. The relation of the plastid to nuclear division in Anthoceros laevis. Amer. Jour. Bot. **22:** 42–49. 2 pl. 1935.

MIDUNO, TADAMASA. Zytologische Untersuchungen der Bryophyten. I. Die Morphologie der Spermatozoiden einiger Hepaticeen. Journ. Fac. Sci. Imp. Univ. Tokyo Sect. III. **4:** 367–387. 4 pl. 2 tables. 1934.

MIDUNO, TADAMASA. Zytologische Untersuchungen der Bryophyten. II. Die Morphologie des Spermatozoids von Wiesnerella denudata. Bot. Mag. [Tokyo] **48:** 814–822. 8 fig. 1 pl. 1934.

NOGUCHI, A. On a species of Musci, Eriopus japonicus Card. et Ther. Bot. Mag. [Tokyo] **49:** 402–403. 5 fig. 1935. [The species proves to be a Lopholejeunea.]

SAKURAI, K. Beobachtungen über japanische Moosflora. VI. Bot. Mag. [Tokyo] **48:** 383–399. 1934.

SAKURAI, K. Beobachtungen über Japanische Moosflora. VII. Bot. Mag. [Tokyo] **49:** 126–144. 1935.

TINNEY, FRED W. Chromosome structure and behavior in Sphaerocarpos. Amer. Jour. Bot. **22:** 543–558. 2 pl. 1935.

VERDOORN, TH. de Frullaniaceis XIV. Revision der von Ozeanien, Australien und Neuseeland angeführten Lejeuneaceae Holostipae. Blumea **1:** 216–240. 1934.

WISNIEWSKI, TAD. UND IR. REJMENT. Das montane Element in der Lebermossflora des Seengebietes von Suwalki. Bull. Acad. Polon Sci. et Lettr. Sér. B; (1) 1935. 11–31. 2 maps. 1935.

UNIVERSITY OF CINCINNATI

X-QK 31
.F8 #4

Reprinted from THE BRYOLOGIST, Vol. XXXIX, May-June, 1936

# RECENT LITERATURE ON HEPATICS

M. FULFORD

ALLEN, CHARLES E. Polyploidy in Sphaerocarpos. Sixth Intern. Congress of Genetics **2:** 1–2. 1932.

ALLEN, CHARLES E. A diploid female gametophyte of Sphaerocarpos. Nat'l. Acad. Sci. Proc. **20:** 147–150. 4 fig. 1934.

BUCH, HANS. Verzeichnis der von H. Roivanen in Südchile während der Auer-'schen Feurlandexpedition im Jahre 1929 gesammelten Plagiochila-arten. Ann. Bryol. **7:** 1–5. 8 fig. 1934.

BUCH, HANS. Bryophyta nova. 25. Calypogeia Meylanii Buch sp. nov. Ann. Bryol. **7:** 161–162. 2 fig. 1934.

CHALAUD, G. Observations sur les spores de Fegatella conica et leur mode de germination. Ann. Bryol. **7:** 9–18. 14 fig. 1934.

HORIKAWA, Y. Symbolae Florae Bryophytae Orientali-Asiae. I. Bot. Mag. [Tokyo] **48:** 452–462. 4 fig. 1934.

HORIKAWA, Y. Symbolae Florae Bryophytae Orientali-Asiae. II. + III. Bot. Mag. [Tokyo] **48:** 587–598; 708–719. 4 fig. 1934.

JOHANSEN, D. A. Haploid chromosomes of Riccia glauca. Bull. Torrey Bot. Club **61:** 381–383. 3 fig. 1934.

KHANNA, L. P. A new species of Notothylas from Rangoon. Rev. Bryol. et Lichén. **6:** 116–118. 4 fig. 1933.

MALMBORG, STEN VON. Weiteres über die Gattung Cryptothallus. Ann. Bryol. **7:** 108–110. 2 fig. 1934.

O'HANLON, SISTER MARY ELLEN. Comparative morphology of Dumortiera hirsuta. Bot. Gaz. **96:** 154–164. 35 fig. 1934.

SCHIFFNER, V. Über Cryptothallus mirabilis Malmb. Ann. Bryol. **7:** 165–166. 1934.

SCHIFFNER, V. Macvicaria und Madotheca ulophylla. Ann. Bryol. **7:** 111–120. 3 fig. 1934.

SILER, MARGARET B. Chromosome numbers in certain Ricciaceae. Nat'l. Acad. Sci. Proc. **20:** 603–607. figs. 1–17. 1 table. 1934.

VERDOORN, FR. Lejeuneaceae Holostipae. Nova Guinea. Résultats de l'Exp. Scient. Neerland. à la Nouv.-Guinée. 18, Bot. 1. pp. 1–8. 2 pl. Leiden. 1934.

VERDOORN, FR. Bryologie und Hepaticologie, ihre Methodik und Zukunft. Ann. Bryol. Suppl. IV. 1–39. 3 fig. 1934.

VERDOORN, FR. de Frullaniaceis XV: Die Lejeuneaceae Holostipae der Indomalaya unter Berücksichtigung sämtlicher aus Asien, Australien, Neu Seeland und Ozeanien angeführten Arten. Ann. Bryol. Suppl. IV. 40–192. 3 fig. 1934.

VERDOORN, FR. de Frullaniaceis XVI: Über die asiatischen Tamarisineae, ihre Linea und Oelkörper. Ann. Bryol. Suppl. IV. 193–203. 1934.

UNIVERSITY OF CINCINNATI.

A-OM 31
·F8 #15

Reprinted from THE BRYOLOGIST. Vol. XXXIX. July-August, 1936

## RECENT LITERATURE ON MOSSES

M. FULFORD

ALLORGE, P. Notes sur la flore bryologique de la Péninsule Ibérique. IX. Muscinées des provinces du Nord et du Centre de l'Espagne. Rev. Bryol. et Lichén **7:** 249–301. 1934.

ALLORGE, P. Nouvelle contribution à la flore bryologique du Maroc espagnol. Rev. Bryol. et Lichén **7:** 304–306. 1934.

BIZOT, M. Bryum canarienses Brid. au Maroc. Rev. Bryol. et Lichén. **7:** 303–304. 1934.

BOULAY DE LESDAIN. Les Fontinalis des environs de Dunkerque. Rev. Bryol. et Lichén **7:** 302–303. 1934.

BOROS, A. UND B. ZOLYMOI. Beiträge zur Moosflora des "Hansag." Bot. Közlem **31:** 271–272. 1934. [German summary.]

DUCLOS, P. Les Herbiers bryologiques de Déy et de Ravin. Bull. Ass. Nat. Vallée Loing 1934. 56. 1934.

DANILOV, A. N. ET C. I. LADYSHENSKAJA. Varabilité individuelle de la mousse Drepanocladus aduncus. Sovietskaja Botanika **6:** 27–44. 1934.

DIXON, H. N. Manchurian Mosses. Rev. Bryol. et Lichén **7:** 105–116. 1934.

GAUME, R. Les Dicranum de la fôret de Fontainebleau. Bull. Ass. Nat. Vallée Loing 1934. 49. 1934.

GYÖRFFY, I. Anomalies du Grimmia triformis en Suisse. Bull. Soc. Bot. Genève **25:** 264–268. 5 fig. 1934.

GYÖRFFY, I. Eine Doppelkapsel von Catharineae tenella aus Steiermark. Österr. Bot. Ztschr. **83:** 292–293. 1 fig. 1934.

HILLIER, L. Aperçu bryologique sur la fôret de la Serre (Jura). III Rev. Bryol. et Lichén **7:** 188–218. 1934.

IHSIBA, E. Materiae Florae Bryophytae Hipponicae. Transactions of Sapporo Nat. Hist. Soc. **13:** 394–397. 1934.

JUDAY, C. The depth distribution of some aquatic plants. Ecology **15:** 325. 1934. [Three mosses.]

JOVET, P. Le Bryum erythrocarpum Schw. Ses différentes stations principalement dans le Valois. Bull. Soc. Bot. France **81:** 442–449. 1934.

LATZEL, A. Beitrag zur Kenntnis der Moose des Komitats Baranya. Magyar Bot. Lapok **33:** 160–191. 1934.

LOESKE, L. Über Tayloria splachnoides und Dicranum Blyttii im nord deutschen Tieflande und über Cynodontium Limprichtianum. Hedwigia **74:** 214–223. 1934.

MAIRE, R. ET R. G. WERNER. Contribution à la flore cryptogamique du Maroc. IV. Bull. Soc. Hist. Nat. Afrique Nord **25:** 40–60. 1934.

MURRAY, JAS. Cumberland Mosses. North Western Naturalist **8:** 53–54; 141–142; 249–250; 331. 1933. **9:** 58–59; 161; 281–282. 1934. [367 species and 71 varieties of mosses, 15 species of Sphagnum.]

PORTER, C. L. The moss genus Brachythecium in Wyoming. Univ. Wyoming Pub. Sci. **1:** 235–241. 1934.

X-OK 31
.F8 #16

Reprinted from THE BRYOLOGIST, Vol. XXXIX. July-August, 1936

## RECENT LITERATURE ON HEPATICS

M. FULFORD

ALLEN, CHARLES E. The Genetics of Bryophytes. Botanical Review **1**: 269–291. 1935.

ALLEN, CHARLES E. The Course and significance of sexual differentiation. Wisconsin Acad. Sci., Arts and Letters, Trans. **29**: 195–202. 1935.

APINIS, A. AND A. M. DIOGUCS. Data on the ecology of Bryophytes. I. Acidity of the substrata of Hepaticae. Acta Horti Bot. Univ. Latviensis **8**: 1–19. 1933. (1935) Riga.

BLAIKLEY, N. M. The Structure of the foot in certain mosses and in Anthoceros laevis. Roy. Soc. Edinburgh Trans. **57**: 699–709. 10 fig. 1932–33. (1934.)

BRUNN, H. G. Ricciocarpus natans (L.) Corda i Upsala. Bot. Notiser 1934. 493. 1934.

BUCH, H. Scapania Simmonsii Bryhn et Kaal., ein für das Festland Europas neues Lebermoos. Mem. Soc. Fauna et Flora Fennica **9**: 142. 1932–33. (1934.)

CHALAUD, G. Notes bryologiques. V. Observations sur Scapania subalpina (Nees) Dum., d'-Ax-les-Thermes (Ariege). Bull. Soc. Hist. Nat. Toulouse **65**: 469–478. 2 fig. 1933.

CHALAUD, G. Hépatiques de la Haute-Ariège. Rev. Bryol. et Lichén. **8**: 70–104. 1 pl. 1935.

DOUIN, ROBERT. Les Variétés du Pellia fabbroniana Raddi. Rev. Gen. Bot. **47**: 65–69. 6 fig. 1935.

EVANS, A. W. Recent Segregates from the Genera Lophozia and Sphenolobus. BRYOLOGIST **38**: 61–70. 1935.

X-QK 31
.F8

Reprinted from THE BRYOLOGIST, Vol. XXXIX, September-October, 1936.

## RECENT LITERATURE ON MOSSES

M. FULFORD

A[LBRECHT], J. H. Leopold Loeske (1865–1935). Brit. Bryol. Soc. Rept. **3**: 246. 1935.

AMANN, J. Etudes des Muscinées du Massif de Naye. Mém. Soc. Vaud. Sci. Nat. **5**: 79–102. 1935.

BARNHART, J. H. The published work of Elizabeth Gertrude Britton. Bull. Torrey Bot. Club **62**: 1–17. 1935.

BERGNER, K. Ein zweiter Fund von Nanomitrium tenerum (Bruch) Lindb. var. longifolium (Philib.) Limpr. Hedwegia **75**: 142–144. 6 fig. 1935.

BRINKMAN, A. H. Some Notes on Grimmia. Prov. Brit. Columbia, Report of the Provincial Museum of Natural History 1934. 14–15. 1935.

BUCH, H. Archidium alternifolium (Dicks.) Schimp. an der Nordgrenze seines europäischen Verbreitungsgebeites. Mem. Soc. Fauna et Flora Fennica **10**: 382–384. 1933–1935.

BURGERS, A. Notes on the mosses of the New South Wales. II. Linn. Soc. N. S. Wales. Proc. **60**: 83–93. 1935.

CONARD, Henry S. Mosses and soil erosion. Iowa State College Jour. Sci. **9**: 133–137. 1935.

Gift
Author
Nov. 3, 1941

5
Copy

X-QK 31
.F8 #18

Reprinted from THE BRYOLOGIST, Vol. XXXIX, September-October, 1936.

# SOME HEPATICAE FROM WASHINGTON, OREGON AND IDAHO COLLECTED BY DR. ARTHUR SVIHLA

MARGARET FULFORD

Through the courtesy of Miss Caroline C. Haynes the collections made by Dr. Arthur Svihla in Washington, Oregon and Idaho during 1930, 1931, and 1932 were sent to the writer for determination. They include about 480 packets with 33 genera and 61 species. Three of the species are new records for Washington and are indicated by asterisks (*) in the following list. During the course of the work Dr. Alexander W. Evans has been consulted frequently and he has given generously of his time in verification and determination of specimens.

A complete set of the species has been sent to Dr. Svihla and a set of the specimens placed in the Sullivant Moss Society Hepaticae Herbarium.

## Ricciaceae

RICCIA CRYSTALLINA L. Washington.—Kittitas Co.: Lake Kachess *313*, *314c*.

RICCIA FROSTII Aust. Washington.—Asotin Co.: Snake River *146a*, *146b*. Whitman Co.: Snake River opposite Clarkston 161, 173.

RICCIOCARPUS NATANS (L.) Corda. Washington.—Whitman Co.: Bonnie Lake *147*.

## Rebouliaceae

ASTERELLA LINDBERGIANA (Corda) Lindb. Washington.—Clallam Co.: Elwha River *235*.

## Marchantiaceae

CONOCEPHALUM CONICUM (L.) Dumort. Washington.—Clallam Co.: Bowman Creek *170* p.p.; Elwha River *220*, *233*, *234*, *252*, *253*; Olympic Hot Springs *18* p.p., *135*; mouth of Sekiu River *86*, *87* p.p., *90*. Grays Harbor Co.: Lake Quinault *464*.

MARCHANTIA POLYMORPHA L. Washington.—Clallam Co.: Bowman Creek *266*; Elwha River *222*, *239*; Olympic Hot Springs *35*, *35a*, *103*, *104*, *105*, *106*, *114*, *119*, *119a*, *131*; mouth of Sekiu River *53*, *54*. Kittitas Co.: Lake Kachess *310*, *312*, *361*. Whatcom Co., Mt. Baker National Forest: Church Mountain *450*. Whitman Co.: Bonnie Lake *148*. Idaho.—Latah Co.: Moscow Mountain *186a*. Clearwater Co.: Elk River *157*; east fork of Clearwater River *151*, *152*, *155*.

PREISSIA QUADRATA (Scop.) Nees. Washington.—Clallam Co.: Elwha River *240*, *242*.

## Riccardiaceae

RICCARDIA LATIFRONS Lindb. Washington.—Clallam Co.: Bowman Creek *167a*, *169* p.p.; Elwha River *28,4a* p.p., *28,4c* p.p., *286c*, *288a*, *289* p.p.; mouth of Sekiu River *65*, *72*, *73*, *74* p.p. Grays Harbor Co.: Copalis *468*. King Co.: near

QK 31
.F8

Reprinted from THE BRYOLOGIST, Vol. XXXIX, November-December, 1936.

# RECENT LITERATURE ON MOSSES

M. FULFORD

ALLORGE, P. L'Orthothecium Duriaei (Mont.) Besch. au Maroc. Rev. Bryol. et Lichén. **8:** 116. 1935.

AMANN, J. La répartition, en Suisse, des Muscinées de l'élément oceanique. Bull. Murithienne **51:** 46–63. 1933–34.

AMANN, J. Le Viscol. Nouveau medium pour préparations microscopiques des Cryptogames cellulaires. Rev. Bryol. et Lichén. **8:** 188–193. 1935.

BARTRAM, E. B. Additional Costa Rica Mosses. III. Jour. Washington Acad. Sci. **24:** 467–480. 3 fig. 1934.

BARTRAM, EDWIN B. Polynesian Mosses. Bernice P. Bishop Museum Occasional Papers **10:** 1–28. 12 fig. 1933.

BEAULAC, A. Notes sur quelques additions à la flore bryologique du Québec région de Montreal. (1) Nat. Canad. **61:** 324–325. 1934.

BEIJERINCK, W. Sphagnum et Sphagnetum. Nederl. Biol. Stat. Medel., Nr. 6, Amsterdam 1934. 1–116. 60 fig. 1934.

BERGER, R. Moos-Kleinbestände aus Nordtirol. Veröffentl. Mus. Ferdinandeum in Innsbruck 1933. 253–258. 1933.

BUCH, H. Muscinées récoltées dans le Nord-Ouest de la Péninsule Ibérique, 15. juin-1. octobre 1930. Rev. Bryol. et Lichén. **7:** 238–248. 1 fig. 1934.

CAVANAGH, L. M. Notes on Iowa Mosses. V. Iowa Acad. Sci. Proc. **39:** 53–55. 1934.

DENING, K. Untersuchungen über sexuellen Dimorphismus der Gametophyten bei heterothallischen Laubmoosen. Flora **30:** 56–86. 3 fig. 1935.

DIXON, H. N. Miscellanea Bryologica. XII. Jour. Bot. [London] **72:** 12–18. 1934.

DIXON, H. N. Bryological Nomenclature. Rev. Bryol. et Lichén. **7:** 137–141. 1934.

DIXON, H. N. Bryology at the Sixth International Congress. Rev. Bryol. et Lichén. **8:** 226. 1935.

DÖRRIES-RÜHER, KÄTE. Experimentelle Analyse der Genom- und Plasmonwirkung bei Moosen. I. Teilungsgeschwindigkeit. Ztschr. Induktive Abstam. u. Vererbungslehre **52:** 390–405. 3 fig. 1929.

DOUIN, CH. Les rameaux chez les Muscinées. Rev. Bryol. et Lichén. **8:** 213–219. 1 pl. 1935.

DUPRET, H. Étude sur les mousses de la région de Montréal. Contr. Lab. Bot. Univ. Montréal 1934. Nr. 25, viii + 70 pages. 4 fig. 1934.

GAUME, R. Trois nouvelles localités de Brachythecium plumosum (Sw.) Bryol. eur. en Fôret de Fontainebleau. Bull. Ass. Nat. Vallée Loing 1934. 54. 1934.

GYÖRFFY, I. Doppelte Mooskapseln aus Frankreich. Rev. Bryol. et Lichén. **7:** 117–121. 2 fig. 1934.

GYÖRFFY, I. Abnormitäten von Physcomitrium piriforme aus Siebenbürgen

X-QK 31
.F8 #20

Reprinted from THE BRYOLOGIST, Vol. XXXIX, November-December, 1936.

# ADDITIONS TO THE LIST OF HEPATICAE OF KENTUCKY.—I

MARGARET FULFORD

The writer's first report of the Hepaticae of Kentucky in 1934[1] included 83 species. Further collections have yielded three additional species (indicated by asterisks), many new county records (also indicated by asterisks), and additional localities in counties already reported. The following list will complete the report to 1936. Of the total list of 86 species, 11 belong to the Marchantiales, 10 to the thalloid Jungermanniales, 63 to the leafy Jungermanniales, and 2 to the Anthocerotales.

## Ricciaceae

*RICCIA MEMBRANACEA Gottsche and Lindenb. Moist soil. Calloway Co. *Wolfson.*

*RICCIA SOROCARPA Bisch. On soil bank. Wayne Co. *Braun 1001.*

RICCIA SULLIVANTII Aust. *McCreary Co. *Braun 965.*

## Reboulíaceae

REBOULIA HEMISPHAERICA (L.). Raddi. *McCreary Co. *Braun 991:* *Perry Co. *Braun 990:* *Wayne Co. *Braun 992.*

ASTERELLA TENELLA (L.) Beauv. *Bell Co. *Braun 996:* *Calloway Co. *Wolfson:* *Carter Co. *802, 804:* Lewis Co. *967:* *McCreary Co. *Braun 969.*

## Marchantiaceae

CONOCEPHALUM CONICUM (L.) Dumort. *Bell Co. *Braun 975:* Letcher Co. *Braun 971, 974, 976:* Lewis Co. *977, 993:* *McCreary Co. *Braun 970:* *Perry Co. *Braun 972.*

DUMORTIERA HIRSUTA (Sw.) Nees. Wolfe Co. *980.*

MARCHANTIA POLYMORPHA L. *Whitley Co. *986.*

## Riccardiaceae

METZGERIA CRASSIPILIS (Lindb.) Evans. *Bell Co. *Braun 993:* Letcher Co. *Braun 957, 1125* p.p.: *McCreary Co. *Braun 994 996* p.p.: Perry Co. *Braun 995:* *Wolfe Co. *997.*

[1] List of Hepaticae of Kentucky. BRYOLOGIST **37**: 21–28, 1934.

.2X 31
.F8 #21

Reprinted from the Ohio Journal of Science
Vol. XXXVII, No. 5, September, 1937

# SOME CLADONIAE FROM SOUTHWESTERN OHIO

## Cladoniae from Clermont, Brown, and Adams Counties

M. FULFORD,
University of Cincinnati

At the present time there are few published records for species of Cladonia in southwestern Ohio. Dr. Bruce Fink's many papers on Cladonia species include general distribution data rather than locality records, so that while he no doubt studied plants from the southwestern part of the state his published reports do not include such. Mr. Thomas G. Lea[1] listed a number of species but his records are from Hamilton County (Cincinnati) or Northern Kentucky and are not included in this report.

The present paper includes collections from Clermont, Brown and Adams Counties. They are east of Hamilton County (Cincinnati) in the order named, and all of them border on the Ohio River. Except for the hilly areas along the Ohio and its tributaries, Clermont and Brown Counties are mostly made up of poorly drained upland flats of glacial till, where pin oak, swamp white oak, and sweet gum are conspicuous trees. (Much of the area has been cleared and is now under cultivation.) Most of Adams County is unglaciated. It is primarily an area of high hills and narrow valleys. Limestones and shales are the principle underlying rocks though sandstone is occasionally found at the tops of some of the higher ridges. The forests are prevailingly of the deciduous type though occasional pine areas occur.

The Cladonias are most abundant in old abandoned fields in both Clermont and Brown Counties; in Adams County they occur in great abundance along old wagon roads, in open pine woods, and on ridge tops, as well as in the grassy meadows.

The writer wishes to express her sincere appreciation in acknowledgment of the kindness of Dr. A. W. Evans, of Yale University, who has determined the material, and given helpful criticism in the preparation of this paper. Some of the speci-

[1]Lea, Thos. G. Catalogue of the plants, native and naturalized, collected in the vicinity of Cincinnati, Ohio, during the years 1834–1844, by Thos. G. Lea, Philadelphia, 1849.

X-QK 31
.F8 F23

Reprinted from THE BRYOLOGIST, Vol. XLI, April, 1938

# RECENT LITERATURE ON HEPATICS

M. FULFORD

ANDRES, H. *Frullania fragilifolia* Tayl., neu für die Flora des Pfälzer Waldes. Mitt. Bayer. Bot. Ges. München **4:** 280–281. 1936.

AURET, THEODORA B. Observations on the reproduction and fungal endophytism of *Lunularia cruciata* (L.) Dumortier. British Mycol. Soc. Trans. **15:** 163–176. *8 fig.* 1936.

BROWN, MARGARET S. Liverworts and mosses of Nova Scotia. Nova Scotian Inst. Sci. Proc. **19:** 161–198. 1936.

BUCH, H. and R. TUOMIKOSKI. *Scapania sphaerifera* spec. nova auctore Buch et Tuomikoski. Mem. Soc. Fauna et Flora Fennica **11:** 228–230. *11 fig.* 1936.

CAMPBELL, D. H. The relationships of the Hepaticae. Bot. Rev. **2:** 53–66. 1936.

CHALAUD, G. Hépatiques de la Haute-Ariège. Rev. Bryol. et Lichén. **9:** 223–228. *1 pl.* 1936.

DOUIN, C. Les bifurcations chez les Hépatiques à feuilles. Rev. Gén. Bot. **48:** 94–127. *3 pl.* 1936.

DOUIN, R. Sur le photogéotropisme des thalles pédonculaires et capitulaires des Marchantiacées. Compt. Rend. Acad. Sci. [Paris] **201:** 154–156. 1936.

FULFORD, MARGARET. The genus *Bazzania* in the United States and Canada. Amer. Midland Nat. **17:** 385–424. *12 fig.* 1936.

GRAFF, P. W. Invasion by *Marchantia polymorpha* following forest fires. Bull. Torrey Bot. Club **63:** 67–74. 1936.

GRIGGS, R. F. Growth of liverworts from Katmai on "nitrogen-free" sand. Amer. Jour. Bot. **24:** 295–298. *1 fig.* 1937.

HALBSGUT, W. Untersuchungen über die Morphologie der Marchantieenbrutkörper. Jahrb. Wiss. Bot. **84:** 290–334. *7 fig.* 1936.

JONES, D. A. *Cephalozia affinis* Lindb. in Ireland. Brit. Bryol. Soc. Report **1935:** 294. 1936.

KHANNA, L. P. On Indian species of the genus *Anthoceros* Linn. with a description of a new species from Travancore. [*A. Koshii* sp. nov.] Jour. Indian Bot. Soc. **15:** 235–240. *8 fig.* 1936.

KNAPP, E. Heteroploidie bei *Sphaerocarpus*. Ber. Deut. Bot. Ges. **54:** 346–361. *1 Taf.* 1936.

KOEHLER, M. Zweiter Beitrag zur Lebermoosflora des Kassler Gebietes. Rep. Spec. Nov. Regn. Beget. Beih. **92:** 136–150. 1936.

LORBEER, G. Die Umwandlung eines haploiden, genotypisch weiblichen Gamophyten von *Sphaerocarpus Donnellii* in einen Männlichen mit Hilfe von Röntgenstrahlen. Planta **25:** 70–83. *6 fig.* 1936.

LORBEER, G. Die Distanzkonjugation der total heterochromatischen Geschlectschromosomen im triploiden Sporogon von *Sphaerocarpus Donnellii*. Ber. Deut. Bot. Gesell. **54:** 98–123. *2 Taf.* 1936.

PANDE, S. K. Studies in Indian Liverworts: A Review. Jour. Indian Bot. Soc. **15:** 221–233. 1936.

31
·F3

Reprinted from THE BRYOLOGIST, Vol. XLI, June, 1938

# RECENT LITERATURE ON HEPATICS

M. FULFORD

ALLEN, C. E. The chromosomes of *Sphaerocarpus cristatus*. Bot. Gaz. **97**: 846–853. *21 fig.* 1936.

BOWEN, ESTHER J. A note on the conduction of water in *Fimbriaria Blumeana*. Ann. Bot. [London] **49**: 844–848. *6 fig.* 1935.

CHALAUD, G. Excursions hépaticologiques autour d'Ax-les Thermes, des Forges d'Orlu à Naguilles. Ann. Lab. Ax-les Thermes No. 1, 6 p. 1935.

CHALAUD, G. Sur quelques formes et variétés nouvelles d'hépatiques Pyrénéennes. Ann. Bryol. **8**: 31–39. *31 fig.* 1935.

CHALAUD, G. Sur la valeur systématique d'*Eucalyx Müllerianus* (Schiffn.) K. Müller. Ann. Bryol. **8**: 40–46. *13 fig.* 1935.

CHAUDHURI, H. Studies in the physiology of the fungal endophytes of certain Indian liverworts. Ann. Bryol. **8**: 47–56. *6 fig.* 1935.

DAVY DE VIRILLE, A. Sur la coloration des membranes d'une Hépatique (*Alicularia compressa* Nees). Compt. Rend. Soc. Biol. [Paris]. **115**: 1061–1063. 1934.

DOUIN, C. Remarques critiques sur quelques Céphaloziellacées. Rev. Bryol. et Lichén. **8**: 18–31. 1935.

X-QK 31
·F8 #39

Reprinted from BRYOLOGIST, Vol. 41, October, 1938

# RECENT LITERATURE ON HEPATICS

MARGARET FULFORD

BRINKMAN, A. H. Hepaticae of the Pacific Coast and adjoining States. Prov. British Columbia, Report Prov. Museum Nat. History **1937:** 21–23. 1938.

BUCH, H. Die Leistungen S. O. Lindberg's als Bryologe. Ann. Bryol. **8:** 22–30. 1935.

BURGEFF, H. Über Polyploidie bei *Marchantia*. Ztschr. Induktive Abstam. u. Vererbungslehre **73:** 394–403. *4 fig. 2 tab.* 1937.

·F8

Reprinted from The Bryologist, Vol. XLI, December, 1938

# RECENT LITERATURE ON MOSSES

Margaret Fulford

Erlandsson, S. The distribution of *Pterogonium ornithopodioides* (Huds.) Lindb. in the Scandinavian Peninsula and Denmark. Bot. Notiser **1934:** 245–252. *1 fig.* 1934.

Flowers, S. Bartramiaceae. In Grout, A. J., Moss Flora of North America north of Mexico. **2(3):** 152–179. *4 pl.* 1935.

Frye, E. M. *Sphagnum* Bogs of Washington and Oregon. New Flora and Silva. **7:** 105–111. *2 fig.* 1935.

Gardet, G. Notes sur quelques associations muscinales achaliciques de la Gaize du sud de l'Argonne. Bull. Soc. Bot. France **32:** 34–39. *1 fig.* 1935.

Gaume, R. Coup d'oeil sur quelques groupements muscinaux de la Brie. Trav. Crypt. dédiés à Louis Mangin 1931. 12 p. Paris, 1931.

Grout, A. J. Moss Flora of North America north of Mexico. Vol. 2, part 3, 139–210. *pl. 58–83.* Published by the author, Newfane, Vermont, 1935.

Herter, W. Zur Kenntnis der Palmenwälder Uruguays. Bot. Centbl., Beihefte, Abt. 2, **51:** 748–770. *3 pl.* 1934.

Hosseus, C. C. Bemerkungen zum Vorkommen einiger südamerikanischer Fabroniaceen. Rept. Spec. Nov. Regn. Veg. **35:** 174–176. 1934.

Katz, N. J. Zur Kenntnis der Moore Nord-osteuropas. Bot. Centbl., Beihefte. Abt. 2, **46:** 296–394. *1 map, 5 fig.* 1930.

X-QK 31
.F8

# THE CLADONIAE OF EASTERN KENTUCKY

BY
MARGARET FULFORD

Reprinted from LLOYDIA, Vol. 1, pp. 161-167, December, 1938
Published by the
LLOYD LIBRARY
Cincinnati, Ohio

X-QK31.F8 #27

X-QK 31
·F8

Reprinted from THE BRYOLOGIST, Vol. XLII, April, 1939

# RECENT LITERATURE ON MOSSES

MARGARET FULFORD

ÅBERG, G. Untersuchungen über die *Sphagnum*-Arten der Gruppe *Subsecunda* in Europa. Mit besonderer Berücksichtigung ihres Auftretens in Schweden. Arkiv. Bot. **29A:** 1–77. *14 fig. 2 tab. 7 maps.* 1937.

ANDREWS, A. L. Notes on the Warnstorf *Sphagnum*-Herbarium I. Ann. Bryol. **9:** 3–12. 1937.

DAVIS, HELEN BURNS. Life and work of Cyrus Guernsey Pringle. Univ. Vermont. Burlington, Vermont. 756 p. 1936.

DIXON, H. N. On a new Index Bryologicus. Ann. Bryol. **9:** 1–2. 1937.

DIXON, H. N. On a collection of mosses from Laos. Ann. Bryol. **9:** 61–72. 1937.

DIXON, H. N. Bryophyta nova. 26. *Calymperes Carrii* Dix. sp. nov. Ann. Bryol. **9:** 139. 1937.

DIXON, H. N. Bryophyta nova. 27. *Pseudodistichium atlanticum* Dix. sp. nov. Ann. Bryol. **9:** 139. 1937.

DIXON, H. N. Bryophyta nova. 28. *Rhaphidostichum Leeuwenii* Fleisch. MS. in sched. Ann. Bryol. **9:** 140. 1937.

DIXON, H. N. Bryophyta nova. 29. *Schlotheimia atlantica.* Dix. sp. nov. Ann. Bryol. **9:** 140–141. 1937.

DIXON, H. N. and E. B. BARTRAM. S. Berggren's New Zealand Mosses. Bot. Notiser **1937:** 63–84. *7 fig.* 1937.

DÖPP, W. und A. Reviews of recent research: I. Bericht über einige neuere karyologische Arbeiten an Moosen. Ann. Bryol. **9:** 142–152. 1937.

HAGERUP, O. Review: Zur Periodizität im Laubwechsel der Moose. (Det. Kgl. Danske Vidensk. Selskab, Biol. Meddelelser **XI:** 9. 1935.) Ann. Bryol. **8:** 169–172. *14 fig.* 1936.

HORIKAWA, Y. Symbolae Florae Bryophytae Orientali-Asiae I–III. Bot. Mag. [Tokyo] **48:** 452–462; 599–609; 708–719. *4 fig.* 1934.

HORIKAWA, Y. Symbolae Florae Bryophytae Orientali-Asiae et Micronesiae IV–VII. Bot. Mag. [Tokyo] **49:** 49–59; 211–221; 588–595; 671–678. *18 fig.* 1935.

HORIKAWA, Y. Symbolae Florae Bryophytae Orientali-Asiae et Micronesiae VIII–X. Bot. Mag. [Tokyo] **50:** 201–206; 380–385; 556–561. *13 fig.* 1936.

JONES, E. W. The vegetation of Grimsey, Iceland. Jour. Ecology **25:** 222–254. *3 pl. 1 map.* 1937. [Includes mosses and liverworts.]

KABIERSCH, W. Studien über die ostasiatischen Arten einiger Laubmoosfamilien II. (Rhizogoniaceae, Bartramiaceae, Aulacomniaceae, Meeseaceae) Hedwigia **77:** 71–136. *16 fig.* 1937.

KURITA, M. Geschlechtschromosomen und Chromosomenzahlen bei einigen Laubmoosen. Ztschr. Induktive Abstam. u. Vererbungslehre **74:** 24–29. *6 fig.* 1938.

X-QK 31
.F8 #29

Reprinted from THE BRYOLOGIST, Vol. XLII, August, 1939

# RECENT LITERATURE ON MOSSES

MARGARET FULFORD

AMANN, J. Notice sur trois Muscinées de la flore valaisanne. Bull. Murithienne **52**: 40–44. 1935.

ANDRÈS, H. Bryologische Notizen. Jahrb. Nassau. Ver. Naturk. **83**: 36–39. 1936.

BARTHAM, E. B. New and noteworthy mosses from Jamaica. Jour. Wash. Acad. Sci. **26**: 6–16. *5 fig.* 1936.

BROTHERUS, V. F., K. OKAMURA, und A. ZAHLBRUCKNER. Materialen

X-QK 3D
·F8 #30

#30

Reprinted from THE BRYOLOGIST, Vol. XLII, October, 1939

# RECENT LITERATURE ON MOSSES

MARGARET FULFORD

ALLORGE, P. Analyse bryologique de matelas. Rev. Bryol. et Lichén. **10:** 93. 1937.

AMANN, J. Paul Culmann. Rev. Bryol. et Lichén. **10:** 1–7. 1937.

ARWIDSSON, T. och P. J. LUND. Bidrag till kännedomen om Skandinaviens moosflora. II. Mossor från Åsele lappmark. Bot. Notiser **1936:** 101–115. 1936.

———. Bidrag till kännedomen om Skandinaviens moosflora. III. Mosslokaler från Vestagder och Rogaland. Bot. Notiser **1937:** 141–148. 1937.

AUER, A. V. Zur Kenntnis der Verbreitung sowie des Standortscharakters der *Sphagnum*-Arten in Südwestfinnland. Ann. Soc. Zool.-Bot. Fenn. Vanamo **9** (5): 1–21. 1937. [Finnish with German summary.]

BARTRAM, E. B. Bornean mosses, principally from Mount Kinabalu. Philippine Jour. Sci. **61:** 235–252. *1 pl.* 1936.

BIEBL, R. Wirkung der *a*-Strahlen auf die Zellen des Laubmooses *Bryum capillare*. Sitzber. Akad. Wiss. Wien, Math. Naturw. Kl., Abt. IIa, **142:** 381–386. *1 tab. 1 fig.* 1933.

BILLINGS, W. D. and W. B. DREW. Bark factors affecting the distribution of corticolous bryophytic communities. Amer. Midland Nat. **20:** 302–330. *12 fig. 11 tab.* 1938.

BOROS, A. Studii fitosociologici in Muntii Retezatului. Bull. Jard. Musée Bot. Univ. Cluj. **14:** 1–84. 1934.

CONSTANTIN, M. J. Aperçu historique des progrès de la Botanique depuis cent ans 1834–1934. Ann. Sci. Nat., Bot. **16:** Centenaire. 1934.

DIXON, H. N. Index Bryologicus. Rev. Bryol. et Lichén. **10:** 8–10. 1937.

———. Mosses collected in Mauritius by Dr. R. E. Vaughan. Rev. Bryol. et Lichén. **10:** 121–127. 1937.

———. Notulae Bryologicae. I. Jour. Bot. [London] **75:** 121–129. 1937.

GRIMME, A. Die Torf- und Laubmoose des Hessischen Berglandes. Rep. Spec. Nov. Regn. Veget. Beih. **92:** 1–135. 1936.

GUILLAUMOT, ABBÉ. Mousses du Val de Peisey nouvelles ou rares pour la France. Rev. Bryol. et Lichén. **10:** 94. 1937.

HILLIER, L. A propos de *Platygyrium repens* (Brid.) Br. eur. Rev. Bryol. et Lichén. **10:** 92–93. 1937.

———. Notes complémentaires sur les *Fissidens* dans la Chaîne du Jura. Rev. Bryol. et Lichén. **10:** 146–150. 1937.

JANSEN, P. en W. H. WACHTER. Bryologiese Notities II. Nederland. Kruidk. Arch. **45:** 151–157. 1935.

KØIE, M. *Sphagnum Lindbergii* Schimp. ny for Danmark. Bot. Tidsskr. København **44:** 216. *1 fig.* 1937.

X-QK 31
·F8 #31

(over)

#31

Reprinted from THE BRYOLOGIST, Vol. XLII, October, 1939

# RECENT LITERATURE ON HEPATICS

MARGARET FULFORD

ALLEN, C. E. Twenty-five years of cytology. Brooklyn Bot. Gard. Mem. **4**: 11–19. 1936.

———. Fertility and compatibility in *Sphaerocarpos*. Cytologia, Fujii Jubilee Volume **1937**: 494–501. 1937.

ALLORGE, P., et H. PERSSON. Contribution à la flore hépaticologique des îles Açores. Ann. Bryol. **11**: 6–14. 1938. [42 hepatics.]

AMMONS, NELLE. A manual of the liverworts of West Virginia (summary). Univ. Pittsburgh Bull. **34**: 1–7. *1 pl.* 1937.

APINIS, A., and A. M. DIOGUES. Data on the ecology of bryophytes. I. Acidity of the substrata of Hepaticae. Acta Hort. Bot. Univ. Latviensis **8**: 1–19. 1933.

BLOMQUIST, H. Hepaticae collected in the vicinity of Mountain Lake Biological Station, Virginia, 1934. Claytonia **4**: 6–9. 1937.

BOLD, H. C. The nutrition of the sporophyte in the Hepaticae. Amer. Jour. Bot. **25**: 551–557. *25 fig.* 1938.

BOUSQUET, E. Des hépatiques. Leur intérêt en systématique et biologie. Bull. Soc. d'Étude Sci. Nat. Béziers. [Toulouse] **41**: 64–73. *2 pl.* 1937.

BUCH, H. Vorarbeiten zu einer Lebermoosflora Fenno-Skandinas. II. Elf in den letzten Jahren für Finnland nachgewiesene Arten. Mem. Soc. Fauna et Flora Fenn. **11** (1934–35): 195–197. 1936.

———. Vorarbeiten zu einer Lebermoosflora Fenno-Skandinas. III. Die Gattung *Calypogeia* Raddi. Mem. Soc. Fauna et Flora Fenn. **11** (1934–35): 197–214. *3 fig.* 1936.

———. *Telaranea nematodes* aus Irland. Ann. Bryol. **11**: 32–33. 1938.

X-UK 31
·F8

Reprinted from THE BRYOLOGIST, Vol. 43, February, 1940

# RECENT LITERATURE ON HEPATICS

MARGARET FULFORD

BUCH, H. Die Onto-und Phylogenie der Blätter und blattartigen Gebilde der Lebermoose. 6th Intern. Bot. Congress, Proc. **2:** 138–140. 1935.

CAMPBELL, D. H. The phyllidia of *Treubia* and *Calobryum*. 6th Intern. Bot. Congress, Proc. **2:** 142–143. 1935.

FITTING, H. Untersuchungen über die Induktion der Dorsiventralität bei der Brutkörperkeimlingen der Marchantieen. III. Das Licht als Induktor der Dorsiventralität. Jahr. f. Wiss. Bot. **85:** 169–242. *18 tab.* 1937.

HALBSGUTH, W. Untersuchungen über die Morphologie der Marchantieenbrutkörper. Jahr. f. Wiss. Bot. **84:** 290–334. *7 fig.* 1936–1937.

HARRIS, T. M. On *Naiadita*, a strange fossil bryophyte. (Abstract of paper read at the British Association Meeting, 1937.) Ann. Bryol. **10:** 154. 1937.

HERZOG, T. Bryophyten aus den Hochanden von Peru. Repert. Spec. Novarum Regni Veget. **45:** 44–48. *1 pl.* 1938.

HORIKAWA, J. Contributions to the bryological flora of Eastern Asia. IV–V. Jour. Jap. Bot. **12:** 19–27; 666–673. *22 fig.* 1936. [12 hepatics, 12 mosses.]

——— Two new species of thalloid Hepaticae from Japan. [*Plagiochasma nipponica*, *Riccardia pellioides*.] Bot. Mag. [Tokyo] **51:** 427–430. *3 fig.* 1937.

KHANNA, L. P. On two species of *Anthoceros* from China. Indian Bot. Soc., Jour. **17:** 311–323. *11 fig.* 1938.

LEONARD, E. C. and MARY E. PIERCE. Natural History of Plummers Island, Maryland. VII. Hepaticae. Biol. Soc. Wash., Proc. **52:** 21–22. 1939. [18 species.]

LEVANTO, T. Ein plötzliches Massenauftreten von *Ricciocarpus natans* (L.) Corda. Soc. Zool. Bot. Vanamo, Ann. **6**(7): 1–2. 1936.

MÄGDEFRAU, K. Reviews of recent research: 2. Der Wasserhaushalt der Moose. Ann. Bryol. **10:** 141–150. 1937.

MERRILL, E. D. and E. H. WALKER. A bibliography of Eastern Asiatic botany. Bryophyta pp. 638–640. Pp. xlii + 719 (double column). *2 maps.* Jamaica Plain, Mass.: Arnold Arboretum, 1938.

MIDUNO, T. Zytologische Untersuchungen der Bryophyten III. Die Morphologie des Spermatozoids von *Reboulia hemisphaerica*. Cytologia, Fujii Jub. Vol. **2,** 1937: 970–976. *12 fig.* 1937.

SCHIFFNER, V. Monographie der Gattung *Cyathodium* I. Ann. Bryol. **11:** 131–140. *1 fig.* 1938.

SHARP, A. J. Taxonomic and ecological studies of eastern Tennessee bryophytes. Amer. Midland Nat. **21:** 267–354. *36 fig.* 1939.

STEERE, W. C. Bryophytes of Arctic America. II. Species collected by J. Dewey Soper, principally in Southern Baffin Island. Amer. Midland Nat. **21:** 355–367. 1939. [10 hepatics, 64 mosses.]

TATUNO, S. Geschlechtschromosomen bei einigen Lebermoosen. V. Geschlechtschromosomen bei einigen *Frullania*-Arten. Bot. Mag. [Tokyo] **50:** 526–531. *13 fig.* 1936. [Jap. with German summary.]

——— Geschlechtschromosomen bei einigen Lebermoosen. VI–VII. Bot. Mag. [Tokyo] **51:** 812–819; 860–866. *56 fig.* 1937. [Jap. with German summary.]

——— Über Polyploidie und geographische Verbreitung bei *Dumortiera hirsuta*. Bot Mag. [Tokyo] **52:** 434–441. *10 fig.* 1938.

VERDOORN, F. Hepaticology and International Taxonomical Problems. 6th Intern. Bot. Congress, Proc. **2:** 299–302. 1935.

WIGGLESWORTH, GRACE. South African species of *Riella*, including an account of the developmental stages of three of the species. Linn. Soc. Jour.-Bot. **51:** 309–332. *58 fig.* 1937.

UNIVERSITY OF CINCINNATI

X-QK 31
.F8 #33

Reprinted from THE BRYOLOGIST, Vol. 43, August, 1940

# RECENT LITERATURE ON MOSSES

MARGARET FULFORD

ALLORGE, P. Muscineae apud Chevalier (Aug.), les îles du Cap Vert. Flore de l'Archipel. Rev. Bot. Appl. et Agr. Trop. **15:** 1062–1064. 1935. [10 hepatics, 30 mosses.]

BUCH, H. Muscinées récoltées dans le Nord-Ouest de la Péninsule Iberique. Rev. Bryol. et Lichén. **10:** 47–54. 1937.

DIXON, H. N. Review: Grout, A. J. Moss Flora of North America. Jour. Bot. [London] **75:** 333. 1937.

DÖPP, W. Die Kultur von Moosen und Farnen für Unterrichtszwecke. Biologie **4:** 323–329. 1935.

EKLUND, O. *Archidium alternifolium* (Dicks.) Schimp. in Regio aböensis gefunden. Mem. Soc. Fauna et Flora Fenn. **11:** 8–9. 1936.

GYÖRFFY, I. Über die Entdeckung der *Paludella squarrosa* in der Zips. Folia Cryptogamica **2** (1935): 105–120. *1 pl., 1 fig., 1 map.* 1936.

——— Ein neuer Bürger der Mooswelt von Pieniny und der Hohen-Tátra: *Catharinaea Haussknecktii* (Jur. & Milde) Broth. Folia Cryptogamica **2** (1935): 121–122. 1936.

HAYREN, E. Moosfunde 1936 von der Insel Ösel und einigen Nachbarinseln. Mem. Soc. Fauna et Flora Fenn. **12:** 189–193. 1936.

HERZOG, T. Neue Bryophyten vom Ruwenzori und aus dem Patagonischen Inlandeisgebeit. Repert. Spec. Novarum Regni Veget. **45:** 285–292. *3 taf.* 1937.

HILLIER, L. Notules bryologiques. Sur deux mousses peu répandues dans l'Est de la France. Soc. Étude Sci. Nat. Haute-Marne, Bull. **14:** 780–785. 1934.

HOFFMAN, A. A propos de deux formes de *Harpidia* (Muscinées-Hypnacées) récoltées en Seine-et-Oise. Soc. Sci. Nat. Seine-et-Oise, Bull. 1934.

KOTILAINEN, N. J. *Anoectangium compactum* Schwägr. Laatokan Karjalassa. Mem. Soc. Fauna et Flora Fenn. **11:** 133–135. 1936.

KÜHNEMANN, O. Catálogo de los musgos Argentinos. [Catalogue of the mosses of Argentina.] Lilloa [Tucumán] **2:** 37–183. 1938. [1002 spp. belonging to 198 genera.]

LÄMMERMAYR, L. Notizen zur Flora über Gips, Dolomit, Phyllit und Magnesit in Steiermark. Mitt. Naturw. Ver. Steiermark **72:** 27–38. 1935 (1936).

MARISTO, L. *Fissidens Julianus* (Sav.) Schimp. im See Näsijärvi gefunden. Ann. Soc. Zool. Bot. Fenn. Vanamo **6**(7): 4–5. 1935.

MERRILL, E. D. and E. H. WALKER. A bibliography of Eastern Asiatic botany. Bryophyta pp. 638–640. pp. xlii + 719 (double column). *2 maps.* Jamaica Plain, Mass.: Arnold Arboretum, 1938.

NOGUCHI, A. Contributions to the moss flora of Formosa. 1–V. Trans. Nat. Hist. Soc. Formosa **24:** 289–297; 469–473. *4 fig.* 1934. **25:** 63–68. *1 taf.* 1935. **26:** 34–43; 139–147. *4 fig. 1 taf.* 1936.

——— *Octoblepharum albidum* (L.) Hedw. occurs in Formosa. Trans. Nat. Hist. Soc. Formosa **24:** 122–123. *1 fig.* 1934.

——— Two new species of Meteoriaceae from Formosa. Trans. Nat. Hist. Soc. Formosa **24:** 119–121. *2 fig.* 1934.

——— Contributions to the moss flora of Japan and Formosa VIII. Mosses from Botel, Tobago Island. Jour. Jap. Bot. **13:** 784–794. *4 fig.* 1937.

PARIS, C. *Funaria flavicans* Michx. in Iowa. Iowa Acad. Sci., Proc. **44:** 103. 1937.

POTIER DE LA VARDE, R. *Bryotestua* Thér. et P. de la V., genus novum familiae Dicranacearum. Soc. Bot. France Bull. **84:** 558–562. *2 fig.* 1937.

ROMM, H. J. Some notes on the mosses of Macon County, Alabama. South. Appalachian Bot. Club Jour. **2:** 4–6. 1937.

·F8 #34

Reprinted from THE BRYOLOGIST. Vol. 40, October, 1940

# RECENT LITERATURE ON MOSSES

MARGARET FULFORD

ALLORGE, P. Observations sur *Tortula desertorum* Broth., mousse aralo-caspienne des plateaux castillans. Rev. Bryol. et Lichén. **11:** 110–112. 1938.

ANDERSON, L. E. and EVELYN S. BEAVEN. The mosses of Franklin County, North Carolina. Elisha Mitchell Sci. Soc. Jour. **53:** 324–333. 1937.

BARTRAM, E. B. Contribution to the mosses of Fiji. Bernice P. Bishop Mus. Occas. Papers **11:** 1–30. *12 fig.* 1936.

———. Mosses of interior British Guiana. Torrey Bot. Club Bull. **66:** 221–230. *2 fig.* 1939.

DEMARET, F. Catalogue bryologique de la Forêt de Soignes. Jard. Bot. Bruxelles Bull. **14:** 379–423. 1937. [32 hep., 156 mosses.]

DIXON, H. N. Notes on the moss collections of the Royal Botanic Garden, Edinburgh. Roy. Bot. Gard. Edinburgh, Notes. **19:** 279–302. *14 fig.* 1938. [Mosses from India, Ceylon, Assam and Burma, 26 n. sp. and 2 n. var.]

———. Tropical East African Mosses. I. Acrocarpi. Jour. Bot. [London] **76:** 217–228; 249–261. *1 pl.* 1938.

———. International Bryological Nomenclature. Jour. Bot. [London] **77:** 176–178. 1939. [List of proposals on Musci to have been made at the Stockholm Congress.]

——— and R. L. BADHWAR. Some new North-west Himalayan mosses. Bot. Survey India Rec. **12:** 163–179. 1938. [16 n. sp., 2 n. var. described.]

DOUIN, C. Pour comprende l'organisation du gamétophyte des Muscinées. Rev. Bryol et Lichén. **11:** 67–92. *1 pl.* 1938.

GIACOMINI, V. Revisione delle briofite dell'Italia meridionale appartenenti all'erbario A. G. Gasparrini. I. Muschi. Atti Instit. Bot. Pavia, Ser. 4, **10:** 305–319. *2 fig.* 1938. [Italian.]

———. Contributi alla conoscenza della flora briologica della Sardegna. Nuovo. Gior. Bot. Ital. **45:** 567–571. *1 fig.* 1938. [4 hep., 29 mosses.]

HÉE, A. Sphaignes récoltées dans les Vosges. Assoc. Philomath. d'Alsace et Lorraine Bull. **8:** 193–199. 1936.

HOSSEUS, C. C. Beiträge zur Kenntnis der Laubmoose der Provinz Córdoba (Argentien) IV–VI. Repert. Spec. Novarum Regni Veg. **44:** 136–144; 241–243; **45:** 20–43. 1938.

JÄGGLI, M. Excursions bryologiques à Merano (Alto Adige) et à San Remo (Liguria). Rev. Bryol. et Lichén. **11:** 93–99. 1938.

MEYLAN, C. La flore bryologique de la couche de quartzite aptien du col des Essets. Soc. Vaud. des Sci. Nat. Bull. [Lausanne] **59:** 473–478. 1937.

———. Note sur une nouvelle espèce de *Physcomitrium*. Soc. Hist. Nat. l'Afrique Nord. Bull. **28:** 426–427. *1 fig.* 1938.

———. Le *Leskea subtectorum* (Thériot). Rev. Bryol. et Lichén. **11:** 113–114. *1 fig.* 1938.

NOGUCHI, A. Notes on Japanese Musci. I–II. Jour. Jap. Bot. **14:** 25–32; 397–406. *16 fig.* 1938. [3 n. sp., Eng. with Jap. summary.]

———. Studies on the Japanese mosses of the orders Isobryales and Hookeriales. III–IV. Jour. Sci. Hiroshima Univ. Ser. B, Div. 2, **3:** 135–152; 211–224. *1 pl. 13 fig.* 1938–1939.

PAPP, C. Contributiuni la flora bryologică a Romaniei. Bull. Grăd. Bot. Univ. Cluj **17:** 159–164. 1938. [7 hep., 32 sp. with 6 var. mosses.]

PULLEN, O. J. Underground organs of heath bryophytes, in Heath, G. H. and L. C. Luckwill, The rooting systems of heath plants. Jour. Ecology **26:** 331–352. *12 fig.* 1938.

SAKURAI, K. Beobachtungen über japanische Moosflora. XVI. [n. gen. *Hondaella* Dix. & Sak., several n. sp.] Bot. Mag. [Tokyo] **52:** 129–135. *7 fig.* 1938.

X-QK 31
.F8

Reprinted from THE BRYOLOGIST, Vol. 43, December, 1940

# RECENT LITERATURE ON MOSSES

MARGARET FULFORD

ÅBERG, G. *Sphagnum strictum* Sull. funnen vid Sveriges västkust. Svensk Bot. Tidskr. **33:** 418–419. 1939.

APINIS, A. and L. LACIS. Data on the ecology of bryophytes II. Acidity of the substrata of Musci. Acta Horti Bot. Latviensis **1936** (9/10): 1–100. 1936.

APINIS, A. Data on the ecology of bryophytes. III. The significance of Hydrogen-ion concentration on germination of spores and development of some mosses. Acta Horti Bot. Latviensis **1939** (11/12): 1–22. *2 tab.* 1939.

BARTRAM, E. B. Mosses of the Philippines. Philippine Jour. Sci. **68:** 1–437. *20 pl.* 1939. [180 genera, 512 species.]

BOLD, H. The nutrition of the sporophyte in the Musci. Amer. Jour. Bot. **27:** 318–322. *14 fig.* 1940.

CLAUSEN, J., D. D. KECK, and W. M. HIESEY. The concept of the species based on experiment. Amer. Jour. Bot. **41:** 103–106. *1 tab.* 1939.

DIXON, H. The east tropical dioicous species of *Brachymenium* (§ *Orthocarpus*). Brotéria **7:** 180–186. *1 fig.* 1938.

GIACOMINI, V. Distribuzione geografica e nomenclatura del *Fissidens ovatifolius* Ruthe. Arch. Bot. **15:** 281–287. 1939.

HARDY, E. Studies of the post-glacial history of British vegetation. V. The Strophire and Flint Maelor mosses. New Phytol. **38:** 364–396. *1 pl. 15 fig.* 1939.

HOSSEUS, C. Musgos de la República Argentina. Arch. Escuela Farmacia Fac. Cienc. Med. Córdoba. No. 5. 1–42. 1937.

———. Musgos de la República Argentina II. (Contribución al conocimiento de los Musgos de la Provincia de Córdoba (Argentina). Arch. Escuela de Farmacia Fac. Cienc. Med. Córdoba. No. 8. 1–58. 6 fig. 1938.

X-QK 31
·F8

(over)

#36

Reprinted from BULLETIN OF THE TORREY BOTANICAL CLUB, January, 1941, Vol. 68, No. 1, pages 32–42.

# STUDIES ON AMERICAN HEPATICAE—I. REVISION OF THE GENUS THYSANANTHUS

MARGARET FULFORD

(WITH FIFTY-ONE FIGURES)

Three species of *Thysananthus*, a genus of the subgroup Holostipae of the Lejeuneae, have been reported from the Americas and a fourth is here proposed as new. Spruce[1] has described several species under *Lejeunea*, subgenus VIII. *Thysano-Lejeunea*, namely *L. amazonica* from the Amazon country, *L. dissoptera* from Guiana, and *L. pterobryoides* from Ecuador. In addition to these, Nees von Esenbeck[2] described a plant from Jamaica as *Phragmicoma Lehmanniana*, which Stephani later transferred to *Thysananthus*. Verdoorn[3] suggested that this plant was a *Caudalejeunea*. An examination of a portion of the type material shows that it is identical with *Caudalejeunea Lehmanniana* (Gottsche) Evans[4] and it should therefore be reduced to synonymy. Taylor[5] described plants collected in Ecuador by Professor W. Jameson under the name *Thysananthus mexicanus*. His plants do not have the characteristics of the genus *Thysananthus* as it has been delimited by recent monographers so that the species is a member of some other genus of the Lejeuneae.

The genus[6] as understood by Evans,[7] Verdoorn,[3] and others may be characterized as follows: the female inflorescence is terminal on the main stem or principal branch, with innovations proceeding from one or both sides below; the perianth is 3-angled in transverse section, with the ventral keel sharp and distinct; there are no secondary folds or ridges; carinal and surface wings are developed in some species; the female bracts and bracteoles, and the keels of the perianth are toothed to a greater or lesser degree; and the leaves and underleaves usually show some indications of teeth along the margins, particularly in the apical region.

The plants are large and grow in depressed mats or among other bryophytes on the trunks and bases of trees and over logs. The stem is robust and

[1] Hepaticae of the Amazon and Andes. Trans. Bot. Soc. (Edinburgh) **15**: 105–110. 1884.

[2] In Gottsche, Lindenberg & Nees von Esenbeck, Syn. Hep. 302. 1845.

[3] Die Frullaniaceis XV. Die Lejeuneaceae Holostipae der Indomalaya unter Berücksichtigung sämtlicher aus Asien, Australien, Neu-seeland und Ozeanien angeführten Arten. XIII. *Thysananthus*. Ann. Bryol. Supl. **4**: 163–188. 1934.

[4] Hepaticae of Puerto Rico VIII. *Caudalejeunea*. Bull. Torrey Club **34**: 554–557. pl. 33, fig. 1–12. (1907.) 1908.

[5] On some new Musci collected by Professor W. Jameson on Pichincha. Hooker's Jour. Bot. **7**: 187–189. 1848.

[6] For synonymy in the genus *Thysananthus* see Verdoorn, l. c.

[7] Hepaticae of Puerto Rico VIII. *Symbiezidium*, *Marchesinia*, *Mastigolejeunea*, *Caudalejeunea* and *Bryopteris*. Bull. Torrey Club **34**: 533–568. *pl. 31–33*. (1907.) 1908.

BUK 31
.F8#37

(over)

#37

Reprinted from THE BRYOLOGIST, Vol. 44, February, 1941

## GEORGE HALL CONKLIN (1866–1940)

Dr. Conklin passed away March 10, 1940 at St. Mary's Hospital, Superior, Wisconsin, after a brief illness.

He was born at Battle Creek, Michigan, on June 13, 1866. At an early age he decided to become a physician and graduated from the Department of Medicine and Surgery at the University of Michigan in 1888. During his stay at the University he became affiliated with Theta Delta Chi social fraternity, and throughout his later years was always keenly interested in the progress and development of the fraternity. The year after graduation was spent in post-graduate work in this same institution, and he went directly to Superior, Wisconsin, to begin the practice of medicine. For several years, during those early days of horse and buggy, sleigh, or even snowshoes, when the going was particularly rough, he held the position of County Physician for Douglas County. He continued in general practice until 1917, when, soon after the United States entered the war, he volunteered and became a member of a medical replacement unit.

Dr. Conklin was commissioned a Major while at Base Hospital No. 1, Vichy, France, and after the Armistice was assigned to duty at Gondrecour, Germany. After the war he took post-graduate work at Chicago University, specializing in pediatrics and on his return to Superior took up the cause of medical aid for underprivileged children, where for several years, in coöperation with others he conducted the free baby-clinics. In 1929 he became a full-time directing physician of the City Health Department, in which office he did much to improve the health of the

X-QK 31
.F8 #28

Reprinted from THE BRYOLOGIST, Vol. 44, April, 1941

# RECENT LITERATURE ON HEPATICS

MARGARET FULFORD

CAMPBELL, D. H. The evolution of the land plants. i–vii + 1–730. *351 fig.* Stanford Univ. Press. California.

CLEE, D. A. The morphology and anatomy of *Pellia epiphylla* considered in relation to the mechanism of absorption and conduction of water. Ann. Botany **3:** 105–111. *4 fig.* 1939.

DASSEK, MARGARETE. Der Phototropismus der Lebermoosrhizoide. Beitr. Biol. der Pflanzen **26:** 125–200. *26 fig. 1 pl.* 1939.

GEROLA, F. M. La *Radula Visianica* Mass. nelle Alpi Tridentine. Nuovo Gior. Bot. Ital. **45:** 602–603. 1938.

GIACOMINI, V. Revisione delle briofite dell'Italia meridionale appartenenti all' Erbario A. G. Gasparrini. II. Epatiche. Nuovo Gior. Bot. Ital. **46:** 158–163. 1939.

JANSEN, P. and W. H. WACHTER. Bryologiese Notities. III. Nederland. Kruidk. Arch. **48:** 266–277. *11 fig.* 1938.

———. Bryologiese Notities IV, V. Nederland. Kruidk. Arch. **49:** 39–55; 243–260. *7 fig.* 1939.

KNOX, ELIZABETH M. The spores of Bryophyta compared with those of Carboniferous age. Trans. & Proc. Bot. Soc. [Edinburgh] **32:** 477–487. *51 fig.* 1939.

LUISIER, A. Hepáticas dos Açôres. Brotéria **7:** 187–189. 1938.

MCCONAHA, MARJORIE. Ventral surface specializations of *Conocephalum conicum*. Amer. Jour. Bot. **26:** 353–355. *3 fig.* 1939.

MÜLLER, K. Untersuchungen über die Ölkörper der Lebermoose. Deut. Bot. Gesell. Ber. **57:** 326–370. *2 pl.* 1939.

PARLIN, J. Some Maine lichens, hepatics, and mosses. Bull. Josselyn Bot. Soc. **7:** 30–59. 1939.

X-QK 31
.F8

Reprinted from THE BRYOLOGIST, Vol. 44, December, 1941

# STUDIES ON AMERICAN HEPATICAE. II.

## A NEW SPECIES OF BAZZANIA FROM THE WEST INDIES

MARGARET FULFORD

BAZZANIA (§ BIDENTATAE) **platystipula** Fulford

Caulibus gracilibus, prostratis, viridiusculis vel brunneo-luteis; foliis imbricatis, ascendentibus, asymmetrice ovatis, 0.7–1.2 mm. longis, bidentatis; cellulis 24–32 μ diam.; trigoniis magnis, convexis; amphigastriis imbricatis, subquadratis, undulatis vel 4-lobatis; bracteis femineis parte terminale tertia trilaciniatis; perianthio ore breviter ciliato.

Plants in depressed mats or scattered among other bryophytes, light green, becoming yellow-brown in the older portions; stems slender, often coarse-filiform, to 5 cm. long, with leaves to 2 mm. broad, prostrate; lateral branches diverging at a wide angle; flagelliform branches numerous, long: leaf insertion curved in the upper part; the leaves two-toothed, approximate to densely imbricated, ascendent, becoming strongly deflexed on drying, unsymmetrically ovate, 0.7 mm.–1.2 mm. long, 0.5 mm. broad at the base, narrowed to the obliquely truncate, bidentate apex; the teeth acute to acuminate, two to four cells high, two or three cells broad at the base, the sinus lunulate to acute; the leaf cells large, thin walled, their lumina angular-rounded, the trigones large, with convex sides, sometimes confluent, the cuticle faintly verruculose; cells of the apical portion and dorsal base 24 μ–32 μ in diameter, of the median portion larger, and of the base 46 μ–50 μ x 32 μ, not forming a vitta: underleaves approximate to imbricated, subquadrate in outline, broader than the stem, to 0.65 mm. long and broad, attached in a straight line, the lateral margins convex from a straight base, the apex undulate to deeply four-lobed: female branches solitary, the bracts of the intermediate series divided to one-third into usually three laciniae, the lateral margins ciliate and dentate; the innermost series similar, the lateral margins long-ciliate and serrate to dentate: the perianth mouth (immature) short ciliate.

Habitat: On tree bases and logs, in mats or scattered among other bryophytes.

Distribution:[1] JAMAICA: John Crow Peak, 5500–5800 ft., Underwood 692 the type (Y, NY); Blue Mountain Peak, Patterson 23 (F). PUERTO RICO: Luquillo Mountains, Elizabeth Britton (NY).

The distinguishing characteristics of the species are its small size and greenish or yellow-brown color; the ascendent, shortly bidentate

[1] Specimens from the New York Botanical Garden are designated (NY); those from Yale University, including the private collection of Dr. A. W. Evans (Y); and those from the herbarium of the writer (F).

X-QK 31
.F8

X-QK 31 .F8 #40

(over)

#40

Reprinted from BULLETIN OF THE TORREY BOTANICAL CLUB, December, 1941, Vol. 68, No. 9, pages 636–639.

# STUDIES ON AMERICAN HEPATICAE—III. VEGETATIVE REPRODUCTION IN BRYOPTERIS FRUTICULOSA

MARGARET FULFORD

(WITH THIRTEEN FIGURES)

Plants of *Bryopteris fruticulosa* Taylor collected at Punta Gorda, British Honduras, in November, 1932, exhibit an interesting example of vegetative reproduction by means of miniature shoots. These young shoots may be considered of two sorts depending on their place of origin on the plant, although they do not differ in their structure. The one sort originates from individual cells of the leaf and will be designated as leaf-cladia.[1] These are identical with the "Brutsprösschen" of Degenkolbe (2) and other authors. The other sort, the stem-cladia, originates on the stem and occupies the same position on the stem as the sexual branches. These belong to the category "Brutäste."

The leaf-cladia usually arise on the dorsal side of the ordinary, persistent leaves, especially after they are badly weathered or "eroded." They occur on any portion of the surface of the leaf and show no periodicity in their development, one leaf often bearing shoots of different sizes (see figure 1). They also occur on the male bracts.

This type of vegetative reproductive body on persistent leaves has been described in *Plagiochila* (1) and *Bazzania* (10). It is also frequent in many species with caducous leaves, associated with the caducous leaves. Evans (6) has described them in several tropical American genera, and more recently Degenkolbe (2) has given a comprehensive summary of "Brutsprösschen" in Hepaticae.

An ordinary leaf cell becomes more chlorophyllose than those adjacent and divides by means of a wall at right angles to the surface of the leaf (fig. 2), and one or both of the newly formed cells bulge on the dorsal surface (fig. 3). Then from one of these new cells one or two cells are cut off by transverse walls parallel to the leaf surface, so that a very short filament is formed. An apical cell with three cutting faces develops from the end cell after a few cells are cut off through anticlinal divisions. The new shoot is formed by the activities of this cell. The first cells cut off have bulging sides and can easily be distinguished even after the shoot has attained considerable length (figs. 4, 5). The first two leaves are very rudimentary, consisting of only three cells each. Each succeeding leaf becomes larger, and on the fifth or sixth leaf rudimentary lobules become evident. These, too, become

[1] Cladium (κλαδίον, diminutive of κλάδος, a branch or slip) is here proposed as a name for the small detachable branches which are effective in vegetative reproduction. The word was suggested by Dr. H. W. Rickett.

X-QK 37
.F8 #41

Reprinted from THE BRYOLOGIST, Vol. 45, June, 1942.

# RECENT LITERATURE ON MOSSES

MARGARET FULFORD

ARENS, P. Die Geschlechterverteilung bei einigen Splachnaceen. Deut. Bot. Gesell. Ber. **57:** 486–494. 1939.

DIXON, H. N. New and rare Bornean Mosses. Jour. Botany [London] **79:** 57–62; 72–77. 1941.

HERRERA, F. L. Sinopsis de la Flora del Cuzco (Perú). Tome 1. Parte Sistemática. Lima. 1941. [34 hepatics, 159 mosses; *Hygrodicranum Herreraï* R. S. Williams n. sp.]

HERTER, W. G. Zur Kenntnis der Flora von Osturuguay. Bot. Centralbl. Beihefte. Abt. B. **59:** 245–286. *14 fig.* 1939. [11 mosses]

HORIKAWA, Y. Contributions to the bryological flora of eastern Asia. VI. Jour. Jap. Bot. **15:** 359–368. 1939.

————. Contributions to the bryological flora of eastern Asia VII. Jour. Jap. Bot. **16:** 163–171. *3 fig.* 1940.

KAMIMURA, M. Contribution to the Bryological flora of the Island of Kaibato. (Todomosiri). Jour. Jap. Bot. **15:** 727–734. *2 fig.* 1939. [12 hepatics, 41 mosses]

KOPPE, F. and K. KOPPE. *Orthodontium germanicum* n. sp. in Brandenburg. Repert. Spec. Nov. Reg. Veg. **121:** 40–47. *2 Taf.* 1940.

KOPPE, K. Beiträge zur Moosflora des Nabegebietes. Repert. Spec. Nov. Reg. Veg. **121:** 157–172. 1940.

LAZARENKO, A. S. The mosses of the Soviet Far East. Acrocarpae: Andreaeales. Schistostegiales. Jour. Bot. Acad. Sci. RSS Ukraine **1:** 59–100. 1940. [195 species]

LID, J. Mosbollar. Nyt Mag. **78:** 101–104. *4 fig.* 1938. [Englisb summary]

LUISIER, A. Contribuições para o conbecimento da flora briológica do Brasil. I. Broteria Cien. Nat. **10:** 114–132. 1941.

PASSIO, J. Referat: Untersuchungen über das Typensystem der Weissmoore Finnlands. Acta Forest Fenn. **44:** 113–129. 1936.

PENLAND, C. W. T. The alpine vegetation of the southern Rockies and the Ecuadorean Andes. Colorado College Publication, Colorado Springs, Colorado. May 1941. [30 pages]

RICHARDS, D. Bryophytes of Starved Rock State Park, Lasalle County, Ill. Illinois State Acad. Sci. Trans. **33:** 74–77. 1940.

SAKURAI, K. Beobacbtungen über japanisebe Moosflora. XX–XXIII. Bot. Mag. Tokyo **53:** 327. 1939; **54:** 5–11; 167–177. *10 fig.* 1940; **55:** 1–16. *20 fig.* 1941.

STØRMER, P. *Plagiothecium platyphyllum* Moenk. in Norway. Nyt Mag. **78:** 92–94. *2 fig.* 1938. [English summary]

————. Mos og lav på einerklaedde bus på Vestlandet. Nyt Mag. **78:** 99–100. *1 chart.* 1938. [English summary]

————. Bidrag til Telemarks bladmosflora. Nyt Mag. **81:** 81–100. *1 fig.* 1940. [English summary]

THÉRIOT, I. Complement au catalogue des mousses de Cuba et revision de plusieurs genres. II–III. Mem. Soc. Cubana Hist. Nat. **13:** 265–282. *pl. 34–35.* 1939; **14:** 349–372. *pl. 54–55.* 1940.

————. Complement au catalogue des mousses de Cuba. IV. Mem. Soc. Cubana Hist. Nat. **15:** 211–234. *pl. 21.* 1941.

UNO, K. and H. TAKAHASI. The list of mosses in Mt. €hiisan. Bot. Mag. [Tokyo] **54:** 29–32. *3 text-fig.* [4 hepaticae, 57 mosses—2 n. sp., Japanese]

WALLACE, E. C. The mosses of Surrey. Jour. Bot. [London] **79:** 1–11; 17–25. 1941. [267 species excluding Sphagna]

WELCH, WINONA H. History of Indiana bryology. Indiana Acad. Sci. Proc. **49:** 64–68. (1939) 1940.

————. Studies in Indiana Bryophytes III. Indiana Acad. Sci. Proc. **50:** 60–67. *25 fig.* (1940) 1941.

UNIVERSITY OF CINCINNATI

X-QK 31
.F8 #42

Reprinted from THE BRYOLOGIST, Vol. 45, October, 1942.

# A LIST OF KENTUCKY MOSSES

M. FULFORD AND H. T. SHACKLETTE

The published records of Kentucky mosses are surprisingly few and incomplete when one considers the wide variety of geological formations and the diverse habitats within the State. There seem to be only two published lists. One of them, by Dr. Charles Wilkins Short[1] of Transylvania University, was issued as an addition to a catalogue of the flowering plants of Kentucky in 1837, and included thirty-one species and varieties, all of them identified by Sir William J. Hooker. The other list, by G. D. Smith[2] in 1927, reported twenty-nine species. In addition to these records there have been citations of Kentucky mosses in a number of floras, monographic treatments and vegetation studies.

The writers had planned a comprehensive and detailed survey of the mosses of Kentucky which would have required several years of collecting and study for completion but the war has made it necessary to abandon the project for the present. For this reason it seems pertinent to publish the results of our studies to date, with the intention of completing them at some future time.

The list combines the results of the large and numerous collections and studies made by the faculty and students of the Department of Botany of the University of Cincinnati over a period of years, primarily in the eastern half of the State, and the intensive work of Mr. Shacklette in the western half. In particular we wish to mention the extensive collections of Dr. E. Lucy Braun, mostly from eastern Kentucky; the unpublished study of the mosses of Kenton County

[1] Third supplementary catalogue of the plants of Kentucky. Transylv. Jour. Med. **10**: 435–440. 1837.

[2] The Mosses of Kentucky. Kentucky Acad. Sci Trans. **2**: 56–57. 1927

X-QK 31
.F8 #43

Reprinted from THE BRYOLOGIST, Vol. 45, December, 1942

# RECENT LITERATURE ON MOSSES

MARGARET FULFORD

ALBERTSON, N. Bidrag till Falbygdens Moos- och lavflora. Svensk Bot. Tidskr. **35:** 113–132. 1941.

BACHURINA, G. F. (On the bryoflora of the Yenissei River basin.) [English summary] Zhurnal Inst. Bot. Vaun. (Jour. Inst. Bot. Acad. Sci. Ukraine) **31:** 81–116. 1940. [17 sp. *Sphagnum*, 154 Bryales.]

BAEHNI, C. Sur quelques mousses originales de Dickson. Cons. et Jard. bot. Ville d. Genève **8:** 181–189. 1941.

BLOMQUIST, H. L. and LORA LEE ROBERTSON. The development of the peristome of *Aulacomnium heterostichum*. Bull. Torrey Club **68:** 569–584. *28 fig.* 1941.

CONARD, H. S. One hundred Iowa mosses. Proc. Iowa Acad. Sci. **45:** 63–68. 1938.

DIXON, H. N. Additions to the mosses of North Queensland. Roy. Soc. Queensland Proc. **53:** 23–40. 1941.

————. The Chinese species of *Leucodon*. Jour. Bot. [London] **79:** 137–145. 1941.

HERZOG, T. Die Moose der Expedition Ljungner nach Patagonien, 1932/34. Ark. Bot. **29** (A): 21. 1–17. *3 fig.* 1940.

HOSSEUS, C. C. Contribución al conocimiento de la flora briófita del sur de Chile. Parte fisiográfica. Arch. Escuela de Farm. Fac. Ciénc. Med. Córdoba **7:** 757–795. *11 fig.* 1938.

————. La flora briologica Argentina—contribución a su conocimiento. Physis **15:** 1–12. 1939.

————. Musgos del Territorio de Misiones, nuevos para la Argentina. Bol. Ingenieria **2** (3): 1–29. 1939.

JANSEN, P. en W. H. WACHTER. Bryologiese Notities. IV–VI. Nederland. Kruidk. Arch. **49:** 39–55; 243–260; 409–415. *7 fig.* 1939.

LANO, W. B. Mosses in the Virginia Caverns. Science **94** (2444): 414. 1941.

MEYLAN, C. Jules Amann. 1859–1939. [includes bibliography.] Act. Soc. Hel. Sci. Nat. **1939:** 227–232. 1939.

————. Recherches sur les formes alpines du groupe *albicans-glareosum* du genre *Brachythecium*. Bull. Soc. Vaud. des Sci. Nat. **61:** 107–116. *Fig. a–d.* 1940.

————. Contribution à la connaissance de la flore bryologique de l'Islande. Bull. Soc. Bot. Suiss. **50:** 475–499. *4 fig.* 1940.

————. Les muscinees du parc national Suisse et des territoires qui l'entourent. H. R. Sauerländer & Co. Ed., Aarau. Pp. 1–77. 1940.

PERSSON, H. Regarding the fertility of *Aulacomnium androgynum* (Hedw.) Schwaegr. Meddeland. Göteborgs Bot. Trädgård **14:** 185–193. *Map.* 1940–1941.

————. *Atrichum angustatum* (Brid.) Br. & Sch. (*Catharinaea angustata* Brid.) i Skåne. Bot. Notiser **1941:** 337–338. 1941.

RAWITSCHER, F. Caso de um "Perichaetium" interessante num musgo do género *Leucobryum*. Arq. Inst. Biol. [São Paulo] **11:** 427–431. *8 fig.* 1940.

SOWTER, F. A. The cryptogamic flora of Leicestershire and Rutland. Bryophytes. Backus 44/46. Cank St. Leicester. 1941.

SKOTTSBERG, C. Lista sistemática de musgos y liquenes Chilenos. Bol. Mus. Nacion. Chile **19:** 113–132. 1941.

STEERE, W. C. Bryophyta of Canadian Arctic. Collection of Father Arthème Dutilly O. M. I. *In* Flora Arctica, Habitat of the Eskimo. Pp. 1–31. *1 portrait.* Scolasticat Notre Dame, Village Richelieu, P. Q., Canada. 1941.

————. Pleistocene mosses from the Aftonian Interglacial deposits of Iowa. Michigan Acad. Sci. Arts and Letters **27** (1941): 75–104. *5 pl.* 1942.

WALTHER, K. Revision des Verwandtschaftskreises von *Polytrichum piliferum* Schreb. Repert. Spec. Novarum Regni Veg. **48:** 251–255. *1 pl.* 1940.

UNIVERSITY OF CINCINNATI

X-QK 31
·F8 #44

Reprinted from THE BRYOLOGIST, Vol. 45, December, 1942

# RECENT LITERATURE ON HEPATICS

MARGARET FULFORD

ARNELL, A. S. Bidrag till kännedomen om levermoosfloran Norrbotten och Torne Lappmark. Bot. Notiser **1941:** 226–230. 1941.

BRINKMAN, A. H. The study of hepatics (liverworts) in Canada. Canadian Field Nat. **54:** 40–42. 1940.

FULFORD, MARGARET. Studies on American Hepaticae 1. Revision of the genus *Thysananthus*. Bull. Torrey Bot. Club **68:** 32–42. *fig. 1–51.* 1940. [4 species, *T. Evansii* n. sp.]

HERZOG, T. Neue Hepaticae aus Südamerika. Brotéria Ciên. Nat. [Lisbos] **6:** 17–23. *4 fig.* 1937 [4 species new].

——— and C. C. HOSSEUS. Contribución al conocimiento de la flora briofita de sur de Chile. a. Parte sistemática. [84 hepatics, 150 mosses]. b. Parte Fisiogeográfica. Arch. Escuela de Farmacia Fac. Cien. Méd. Córdoba 1938. no. **7:** 1–56. *11 fig.* 1938.

ISAAC, I. The structure of *Anthoceros laevis* in relation to its water supply. Ann. Bot. **5:** 339–351. 1941.

KÜHNEMANN, OSCAR. Géneros de Hepáticas nuevos para Argentina. An. Primeira Reun. Sul.-Amer. Bot. **2:** 211–213. *3 pl.* 1938.

LEPAGE, ABBÉ E. Les hepátiques de Ste.-Anne-de-la-Pocatière, P. Q. Nat. Canad. **68:** 29–30. 1941. [15 species]

LOHAMMAR, G. *Ricciocarpus natans* (L.) Corda Nuvarande Nordeuropeiska Utbredning. Svensk Bot. Tidskr. **34:** 464–475. 1940.

LUISIER, A. Hepáticas dos Açôres. Brotéria Ciên. Nat. **7:** 187–189. 1938.

ÖSTERLIND, F. O. *Nardia compressa* (Hook.) Gray funnen i Jämtland. Bot. Notiser **1941:** 231–232. 1941.

TATUNO, S. Zytologische Untersuchungen über die Lebermoose von Japan. Hiroshima Univ. Jour. Sci. Ser. B, Div. 2. **4:** 73–187. *100 fig. 2 Tafel.* 1941.

VOTH, P. D. and K. C. HAMNER. Responses of *Marchantia polymorpha* to nutrient supply and photoperiod. Bot. Gaz. **102:** 169–205. *14 fig.* 1940.

WALLACE, E. C. The hepatics of Surrey. Jour. Bot. [London] **78:** 257–262. 1940. [81 species]

WOLCOTT, G. B. The effect of colchicine on à hepatic. Jour. Hered. **32:** 67–70. *3 fig.* 1940. [*Pallavicinia Lyellii*]

——— Aneuploidy in a hepatic species. Science **91:** 573. 1940. [*Pallavicinia Lyellii*]

ZOTOV, V. D., N. L. ELDER, A. D. BEDDIE, G. O. K. SAINSBURY and E. A. HODGSON. An outline of the vegetation and flora of the Tararua Mountains. Distribution of Bryophyta, Hepaticae. Royal Soc. New Zeal. Trans. and Proc. **68:** 317–323. 1938. [52 genera, 198 species.]

UNIVERSITY OF CINCINNATI.

F8 #45

Reprinted from THE BRYOLOGIST, Vol. 45, December, 1942

# SPORELINGS AND VEGETATIVE REPRODUCTIVE STRUCTURES IN ARCHILEJEUNEA*

MARGARET FULFORD

During a study of the tropical American species of *Archilejeunea*, both sporelings and vegetative reproductive structures were found to occur frequently, but unfortunately the two were never seen in the same species. The pattern of development of the sporeling is similar to that found in several genera of the Lejeuneaceae Holostipae,[1] but the vegetative reproductive structures are of a form not previously reported in the family.

*Sporelings.*—These occurred in considerable numbers in material of *A. Auberiana* collected at Union Hill, Jamaica (*E. G. Britton 824*) and now in the Herbaria of Yale University and the New York Botanical Garden.

The development follows the *Frullania* type. The spore wall is thick, hyaline, verruculose and with scattered circles of indistinct radiating ridges, and the internal chlorophyll is conspicuous. Almost immediately on separation the spores swell, first becoming rounded and then elongate. The first wall appears to be formed at right angles to the long axis of the cell (fig. 1). Further cell divisions and growth within the much-stretched original exospore cease after four to twelve cells are formed (fig. 4–7). As these cells mature they tend to bulge on the free surface so that the ovoid mass is irregular in outline (fig. 5–7). A rhizoid is usually present (fig. 2–6).

An apical cell with three cutting faces forms at one end of this ovoid mass of cells and the leafy stem is developed through its activities. The first leaves formed are of the primary type, plane, narrowly ovate, and without water sacs (fig. 6 and 7). The number produced on a stem varies but it is usually large, with the internodes very short. No underleaves are associated with these leaves. After a time the larger, bilobed, saccate, juvenile leaves typical of the *Lejeuneaceae* are formed (fig. 8) although leaves similar to the primary type but with few-celled lobules were intermingled with them, so that the transition from the one type to the other was not so direct or so permanent as that observed in some other genera. Underleaves were usually associated with the juvenile leaves. Eventually, through a

* This work was done during a study of tropical American Hepaticae made possible through a John Simon Guggenheim Memorial Fellowship, 1941–1942.

[1] Fulford, M. Development of sporelings in the *Lejeuneaceae*. Bull. Torrey Bot. Club 69: —. *Fig. 1–4.* 1942.

X-QK 31
·F8 #1/6

BULLETIN OF THE TORREY BOTANICAL CLUB
69(9): 627–633 DECEMBER, 1942

# DEVELOPMENT OF SPORELINGS IN THE LEJEUNEACEAE*

MARGARET FULFORD

The observation of the sporeling stages of plants has long been of interest not only because of the information concerning the differentiation and specialization of the tissues involved, but also because of the phylogenetic implications which might be derived from these patterns of development. The literature devoted to this sort of observation in higher plants is rather large and well known and no attempt will be made to review it at this time.

The Bryophyta, particularly the leafy Hepaticae, afford an especially stimulating field for studies of this nature. In the first place, our information regarding the ancestral forms of this geologically ancient group of plants is very fragmentary, and these developmental stories give promise of indicating relationships between the modern groups. In the second place, the various tissues of the leafy liverworts are relatively less complex and the mass of cells involved much smaller, so that the various steps in the developmental story can be studied more clearly—often without making sections. Unfortunately, too little attention has been given to studies of this sort, for at the present time our information concerning the sporeling among the leafy liverworts is very meager.[1]

In working over collections from Central America, sporelings were found in several genera of the Lejeuneaceae. They appear to be of special significance, first, because no examples of sporelings with leaves have previously been reported for this largest and most elaborate family of the leafy liverworts, and secondly, because the basic pattern of development is not uniform throughout the group. The several patterns are described below.

1. LOPHOLEJEUNEA SAGRAEANA. The plants of this species form brownish or blackish green mats on trees and wood. The stems may reach 2 cm. in length, the leaves are ovate and rounded-entire, to 0.75 mm. long and 0.55 mm. wide, with the lobule rather small, but conspicuous and strongly inflated. The underleaves are reniform and undivided.[2] The sporelings[3] were mostly 0.2 mm. long. The four or five distinct leaves were deeply pigmented with brown, as are those of the parent plants. They were identified as spore-

* This work was done during a study of tropical American Hepaticae made possible through a John Simon Guggenheim Memorial Fellowship 1941–1942.

[1] For a summary see **G. Chalaud** in Verdoorn, Manual of Bryology, chapt. 4. 1932.

[2] See **Evans, A. W.** Bull. Torrey Club **34**: *pl. 3, no. 10–20.* 1907, for figure.

[3] Sporelings were found both in the material collected by Steere and Lundell, no. *2060* (Univ. Michigan) in Petén, Guatemala, and by Dodge, Steyermark & Allen no. *16946* (Missouri Bot. Garden), in Panama. All of them were in approximately the same stage of development.

X-QK 31
.F8 #47

Reprinted from LLOYDIA, Vol. 5, pp. 293-304, December, 1942
Published by the
LLOYD LIBRARY
Cincinnati, Ohio

# Studies on American Hepaticae IV—A Revision of the Genus Symbiezidium*

MARGARET FULFORD
(*University of Cincinnati, Cincinnati, Ohio*)

The history of this tropical genus has already been fully discussed by Evans[1] in the "Hepaticae of Puerto Rico VIII." Trevisan[2] established the generic name in 1877 but soon after, Spruce[3] in his study of the South American species included them under his own subgeneric name *Platy-Lejeunea*. Schiffner continued the use of this later name, but in a generic sense, in his treatment of the Hepaticae,[4] so that it is the one usually met with in the literature.

Stephani[5] has recorded a dozen species from the American tropics, and in addition, several from Africa, the Pacific Islands and Australia. About half of the American species are here reduced to synonymy but no correlation of relationships with the exotic species has been attempted.

I wish to acknowledge the kind assistance of Dr. A. W. Evans of Yale University during the course of this study.

## **Symbiezidium** Trevisan, Mem. Ist. Lomb. III. **4**: 402. 1877.

*Lejeunea*, Section *Phragmicomoideae*, Gottsche & Lindenberg, in G. L. & N., Syn. Hep. 310. 1845.
*Lejeunea*, subjenus *Platy-Lejeunea* Spruce, Proc. & Trans. Bot. Soc. [Edinburgh] **15**: 75; 124. 1884.
*Platylejeunea* Schiffner, in Engler & Prantl, Natürl. Pflanzenf. 1[3]: 130. 1893.

Plants usually large, olive-green to brown or reddish, often glossy; stems to 10 cm. long, with leaves to 5 mm. broad, irregularly pinnately branched, the short lateral branches of the *Lejeunea* type, prostrate or pendulous: leaves imbricated, widely spreading, plane, often becoming decurved near the apex, ovate-oblong to broadly ligulate, rounded to subcordate at the dorsal base, the apex broad, rounded, occasionally apiculate or subacute, the margin entire; the lobule oval to rectangular or ovate-lanceolate in outline, inflated throughout or in the portion near the stem, the portion below the sinus often plane, appressed, the apex rounded, with a terminal projecting cell or notched by a slight indentation between two projecting cells, the hyaline papilla on the cell of the indentation, curved inward, within the watersac; leaf cells thin-walled, with small, tri-radiate trigones and circular intermediate thickenings separated by narrow pits, the cell lumina

* This work was done during a study of tropical American Hepaticae made possible through a John Simon Guggenheim Memorial Fellowship 1941–1942.

[1] Bull. Torrey Club **34**: 533–568. pl. 31–33. 1907.
[2] Mem. Ist. Lomb. III. **4**: 402. 1877.
[3] Trans. & Proc. Bot. Soc. [Edinburgh] **15**: 124. 1884.
[4] In Engler & Prantl, Natürl. Pflanzenf. 1[2]: 130. 1893.
[5] Species Hepaticarum V: 98. 1912.

.F8

Reprinted from the AMERICAN JOURNAL OF BOTANY, Vol. 29, No. 10, 848–850, December, 1942
Printed in U. S. A.

# SPORELINGS AND VEGETATIVE REPRODUCTIVE STRUCTURES IN MASTIGOLEJEUNEA AURICULATA

Margaret Fulford

QK495 3M
.F8 #49

Reprinted from THE BRYOLOGIST, Vol. 46, June, 1943

# RECENT LITERATURE ON HEPATICS*

MARGARET FULFORD

BLEHER, H. Ueber Membran-verdickungen im Füllgewebe bei *Pellia epiphylla*. Hedwigia **79:** 65–71. *11 fig.* 1940.

CONARD, H. S. Liverworts of the so-called unglaciated area of Iowa. Iowa Acad. Sci. Proc. **47:** 91–95. *2 fig.* 1940.

_____. Thirty Iowa Liverworts. Iowa Acad. Sci. Proc. **47:** 97–99. 1940.

DA COSTA, J. G. and HERMAN PERSSON. Briófitas do Pôrto Santo. Brotéria Ciênc Nat. **10:** 29–33. 1941. [40 hepatics.]

ESPINOSA, B. Hepaticas chilenas fernandecinas y del continent. Bol. Mus. Nacion. Chile **18:** 125–128. 1940.

FULFORD, MARGARET. Studies on American Hepaticae III. Vegetative Reproduction in *Bryopteris fruticulosa*. Bull. Torrey Club **68:** 636–639. *13 fig.* 1941.

_____. Studies on American Hepaticae IV. A Revision of the Genus *Symbiezidium*. Lloydia **5:** 293–304. *14 fig.* 1942.

_____. Development of Sporelings in the Lejeuneaceae. Bull. Torrey Club **69:** 627–633. *4 fig.* 1942.

HATTORI, S. Notulae de Hepaticis Japonicis (1). *Taeniolejeunea*. (n. sp. *T. Verdoornii*, *T. Hattori*). Journ. Jap. Bot. **17:** 457–466. *2 fig.* 1941. [English.]

HAUPT, A. W. Studies in Californian Hepaticae III. *Cryptomitrium tenerum*. Bot. Gaz. **104:** 264–272. *28 fig.* 1942.

HERZOG, TH. Die Moose der Expedition Ljungner nach Patagonien 1932–1934. Arkiv. Bot. **29** (A): **21.** 1–17. *3 fig.* 1940. [18 hepatics, 36 mosses.]

MIRIMANOFF, A. Contribution à l'étude des corps oléifères des Hépatiques. Schweiz Bot. Gesell. Ber. **49:** 400–404. 1939.

MÜLLER, K. Beiträge zur Systematik der Lebermoose. Hedwigia **79:** 72–80. *1 fig.* 1940.

PARKER, DOROTHY. Additions to the Hepaticae of Indiana I. Indiana Acad. Sci. Proc. **51:** 100–102. (1941) 1942.

STUDHALTER, R. A. The foot of *Riella americana* and its relation to nutrition of the sporophyte. Bot. Gaz. **103:** 633–650. *16 fig.* 1942.

THOMPSON, R. H. The morphology of *Riella affinis*. I. Germination of the spore and development of the thallus. Amer. Journ. Bot. **28:** 845–855. *67 fig.* 1941.

VOTH, P. D. Gemmae-cup production in *Marchantia polymorpha* and its response to calcium deficiency and supply of other nutrients. Bot. Gaz. **103:** 310–325. *6 fig.* 1941.

WALKER, R. and W. PENNINGTON. The movement of the air pores of *Preissia quadrata* (Scop.) Nees. New Phytologist **38:** 62–68. *3 fig.* 1939.

WOLCOTT, G. B. Cytological studies on the Hepaticae. II. The nucleolus-chromosome in Pallavicinia Lyellii. Amer. Journ. Bot. **26:** 41–44. *19 fig.* 1939.

UNIVERSITY OF CINCINNATI
CINCINNATI, OHIO

* Beginning with volume 46 the papers published in The Bryologist will be included in these lists. M. F.

X-QK 31
.F8 #50

Reprinted from THE BRYOLOGIST, Vol. 46, December, 1943

# RECENT LITERATURE ON MOSSES

MARGARET FULFORD

ALLORGE, P. Une Mousse nouvelle pour la France: le *Sematophyllum substrumulosum* (Hampe) Brot. dans l'Estérel. Monde des Plantes **37:** 45. 1936.

———. et H. PERSSON. Mousses nouvelles pour les Açores. Monde des Plantes **39:** 25–26. 1938.

BAEHNI, C. Sur Quelques Mousses originales de Dickson. Candollea **8:** 181–189. 1939–1941. (1941).

BARTRAM, E. B. Mosses collected by Hawaiian Bog Survey of 1938. Bernice P. Bishop Mus. Occas. Papers **16** (14): 321–336. *fig. 1–3.* 1942.

———. Third Archbold Expedition Mosses from the Snow Mountains, Netherlands New Guinea. Lloydia **5:** 245–292. *62 fig.* 1942. [1 new gen., 58 n. sp., 1 new var., 2 comb. new.]

———. Mosses of Papua, New Guinea. Farlowia **1** (1): 41–47. 1943.

BOEHNER, P. The Sphagna of Cattaraugus County, N. Y. Sci. Stud. St. Bonaventure Coll. **9** (2): 3–5. 1941.

———. A list of mosses found in Cattaraugus County, N. Y. Sci. Stud. St. Bonaventure Coll. **10** (3): 25–27. 1942. [about 200 sp.]

CARROLL, GLADYS. The use of bryophytic polsters and mats in the study of recent pollen deposition. Amer. Jour. Bot. **30:** 361–366. 1943.

DIDDELL, MARY W. and E. M. SHIELDS. A moss new to Florida. (*Hypopterygium tamariscí* (Sw.) Brid.) THE BRYOLOGIST **46:** 22–24. 1943.

DIXON, H. Alpine Mosses from New Guinea. Farlowia **1** (1): 25–40. 1943.

———. Papuan mosses (continued). Jour. Bot. [London] **80:** 25–35. 1942.

———. Madagascar Mosses. Jour. Bot. [London] **80:** 41–50. 1942.

———. War Zone Mosses. THE BRYOLOGIST **46:** 14–22. 1943.

X-QK 31
.F8#51

# REPORTS FROM RECIPIENTS OF GRANTS FROM THE RESEARCH FUNDS

MARGARET FULFORD, University of Cincinnati

Grant No. 645 (1942), $1,200. Investigations in morphogenesis and regeneration in certain members of the leafy Hepaticae, particularly of the family Lejeuneaceae.

Studies have been made concerning the anatomical structure and development of *Lejeunea clypeata* including the pattern of development of the spore and the regeneration of new leafy plants from individual leaf cells of mature leaves. It was found that on germination a cylindrical mass of cells, several times as long as broad, develops within the old exospore, and from one end of this (or occasionally at several scattered positions), the leafy shoot develops. Since this pattern of sporeling development has not previously been described, we have called it the *Leucolejeunea* type. The pattern of development of the new plant by regeneration from a single leaf cell follows that already described for species in a number of genera.

With the assistance of Miss Gladys Carroll and Mr. Thomas Cobbe, a satisfactory method of growing leafy liverworts in nutrient solution in the laboratory was developed. Using this method, two series of *Leucolejeunea clypeata* of fifty-six cultures each (in all about 650 plants), were grown under experimental conditions for four months in order to determine the reactions of the plants to variations in the nutrient solution. The reactions were, for the most part well marked, but they did not in every instance agree with the reported reactions of flowering plants.

With the assistance of Miss Carroll twelve additional species in several genera and families were grown on full nutrient solution and all but one showed indications of regeneration of new plants from individual leaf cells. In many of the species it was possible to observe the whole series of stages from the time of the dedifferentiation of the leaf cell to the formation of the new plant. At the same time the germination of the gemmae was observed in five of the species.

In collaboration with Dr. Harold Kersten, a series of cultures of *Frullania Asagrayana*, *Leucolejeuna clypeata*, and *Scapania nemerosa* were irradiated with soft x-rays for different lengths of time to determine the approximate maximum dosage to which these plants can be subjected without a lethal effect. The x-rays were

Reprinted from YEAR BOOK OF THE AMERICAN PHILOSOPHICAL SOCIETY, 1944, 169–170
Printed in U. S. A.

X-QK 31
.F8 #52

Reprinted from THE BRYOLOGIST, Vol. 47, March, 1944.

# RECENT LITERATURE ON MOSSES

MARGARET FULFORD

ANDERSON, L. The distribution of *Tortula pagorum* (Milde) de Not. in North America. THE BRYOLOGIST **46:** 47–66. 1943.

BARTHELMESS, A. Mutationsversuche mit einem Laubmoos, *Physcomitrium piriforme.* I. Phänanalyse der Mutanten. Ztschr. f. Induktive Abstam. u. Vererbungslehre **74:** 479–518. *15 figs. 5 tables.* 1938.

BARTRAM, E. Additions to the moss flora of northern Chile. Farlowia **1:** 191–194. *figs. 1–8.* 1943.

———. Burma Mosses. Farlowia **1:** 171–189. 1943.

BAUER, L. Untersuchungen zur Entwicklungsgeschichte und Physiologie der Plastiden von Laubmoosen. Flora [Jena] **36:** 30–84. *23 figs.* 1942.

CHRISTOPHERSEN, E. Plants of Tristan da Cunha: with the co-operation of Carl Christensen, H. N. Dixon and Bernt Lynge. Scientific Results of the Norwegian Antarctic Expeditions 1927–1928, et seq. no. 16, Oslo, 1937, p. 19. [Hepaticae p. 14; Musci p. 15]

ERNST-SCHWARZENBACH, MARTHE. The sexual dimorphism of the tropical mosses of the genus *Macromitrium.* Farlowia **1:** 195–198. *5 figs.* 1943.

GYÖRFFY, I. Moosabnormitäten von den West-Beskyden bis zu den Ost-Beskyden. Bot. Közlem. **36:** 36–44. *fig. 16.* 1939. [Ung. u. Deutsch.]

———. Moha teratomák a Nagy Alföldröl. Bot. Közlem. **36:** 81–85. *6 figs.* 1939.

———. Moos-teratomata aus der Grossen Ungarischen Tiefebene. Bot. Közlem. **36:** 85–89. 1939.

HEITZ, E. Die keimende *Funaria*-Spore als physiologisches Versuchsobjekt. Deut. Bot. Gesell. Ber. **60:** 17–27. *10 figs.* 1942.

LANG, WALTER B. Mosses in the Virginia caverns. Science **94:** 414. 1941.

———. The mosses of Luray Cavern, Virginia. Science **98:** 173, 174. 1943.

MEYER, S. L. and C. H. FORD. Influence of the Hydrogen-Ion Concentration of the substrate on the development of leafy moss plants. Plant Phys. **18:** 530–533. 1943.

MUGGOCH, HELEN and J. WALTON. On the dehiscence of the antheridium and the part played by surface tension in the dispersal of spermatocytes in Bryophyta. Roy. Soc. London. Proc. Ser. B.: Biol. Sci. **130:** 448–461. *7 figs.* 1942.

OSVALD, H. *Sphagnum flavicomans* (Card.) Warnst. Taxonomy, distribution and ecology. Acta Phytogeog. Suecica **13:** 39–49. *4 pls. 2 figs.* 1940.

RICE, MABEL. Bryophytes in the vicinity of Wheaton College, Norton, Massachusetts. THE BRYOLOGIST. **46:** 66–71. 1943.

STEERE, W. Pleistocene mosses from Louisiana. Dept. of Conservation, Louisiana Geol. Survey, Geol. Bull. **12:** 97–101. *pl. 14.* 1938.

TÄRNLUND, C. Riksmusseets Mossherbarier. Deras Tillkomst och Utveckling. Svensk Bot. Tidskr. **35:** 57–74. 1941.

THÉRIOT, I. Quelques mousses du Chili austral recoltées a Freire par Mr. Raul Gillet L., en Fevrier 1934. Rev. Chilena Hist. Nat. **38:** 83–85. 1934.

TOLSTEAD, W. A flora of Winneshiek and Allamakee Counties and Clayton County in the Vicinity of McGregor. Iowa State Coll. Jour. Sci. **12:** 321–334. *2 pls.* 1938. [33 spp. mosses]

TOYAMA, R. Spicilegium Muscologiae Asiae Orientalis, 2. Acta Phytotaxonom. et Geobot. **6:** 42–45. *2 figs.* 1937. [Japanese]

———. Spicilegium Muscologiae Asiae Orientalis, 3. Acta Phytotaxonom. et Geobot. **6:** 101–107. *5 figs.* 1937. [Japanese summary]

———. Spicilegium Muscologiae Asiae Orientalis, 4. Acta Phyto-

X-01 31
·F8 #53

(Over)

#53

Reprinted from THE BRYOLOGIST, Vol. 47, June, 1944

# VEGETATIVE REPRODUCTION IN PORELLA PINNATA L.

MARGARET FULFORD

The material was collected by Dr. A. J. Sharp near Gatlinburg, Tennessee, in November. On arrival it was placed in a moist chamber in the laboratory where it was kept until used. A month later plants were still healthy and green in color but were badly contaminated with an obscure cottony fungus and filamentous green alga. No instances of regeneration were seen. At this time two cultures containing several stems each were set up in petri dishes. These were supplied regularly with nutrient solution and were kept under artificial light. After a month under these conditions plants from both of the cultures showed numerous instances of vegetative propagation, ranging from bulging leaf cells to leafy shoots.

The development of the propagula follows in a general way that already described for several species of Bazzania.[1]

[1] Fulford, M. Amer. Midland Nat. 17: 408. *fig. 8.* 1936.

X-QK 31
.F8 #54

Reprinted from THE BRYOLOGIST, Vol. 47, June, 1944.

# RECENT LITERATURE ON MOSSES

MARGARET FULFORD

AMMONS, NELLE. Bryophytes of the Appalachian Shale Barrens. Castanea **8:** 128–131. 1943.

ANDREWS, A. L. Taxonomic Notes, III. Further Synonyms of Hymenostylium curvirostrum. BRYOLOGIST **46:** 131–135. 1943.

BARKLEY, ELIZABETH. Gemmae of Funaria hygrometrica. Illinois Acad. Sci. Trans. **34:** 102–104. *1 pl.* 1941.

CHEN, P.-CH. Studien über die ostasiatischen Arten der Pottiaceae. I. Hedwigia **80:** 1–76. *12 fig.* 1941.

CONARD, H. S. The Sullivant Moss Society in 1942 (Report). BRYOLOGIST **46:** 104. 1943.

DIXON, H. N. Notes on Fissidens japonicus. BRYOLOGIST **46:** 128–131. 1943 (1944).

FRYE, T. C. and ELIZABETH FERGUSON. Pogonatum Liebmannianum. BRYOLOGIST **46:** 141–146. *25 fig.* 1943 (1944).

HARING, INEZ. Mosses collected by the Robert A. Bartlett Greenland Expedition 1940. BRYOLOGIST **46:** 88–91. 1943.

HEADY, H. F. Annotated List of the Mosses of the Huntington Forest. Roosevelt Wildlife Bull. **8:** 41–58. 1942.

LITTLE, E. L. Later Generic Homonyms among North American Mosses. BRYOLOGIST **46:** 105–125. 1943 (1944).

MERRILL, E. D. An Index to Rafinesque's published technical names for the cellular cryptogams. [2 musci] Farlowia **1:** 245–262. 1943.

MURRILL, WILLIAM A. Bryophytes of Alachua County. [Mimeographed Contribution (of 9 pages) from the Herbarium of the University of Florida Agricultural Experiment Station, Gainesville.] Nov. 1938.

PATTERSON, P. M. Additional Mosses from Mountain Lake, Virginia. BRYOLOGIST **46:** 126–128. 1943 (1944).

SCHNOOBERGER, IRMA. The 1942 Foray. BRYOLOGIST **46:** 146–148. 1943 (1944).

STEHLÉ, H. La Vegetation muscinales des Antilles Françaises et son intèrêt dans la valorisation sylvicole. Carib. Forest. **4:** 164–182. 1943.

VECCHIERELLO, H. List of Mosses mentioned by Davis F. Day in his Catalogue of plants of Western New York, brought up-to-date with reference to terminology, etc. Sci. Stud. St. Bonaventure College **11:** 11–14. 1943.

WICKES, MILDRED L. Mosses of Labrador. BRYOLOGIST **46:** 91–102. *1 fig.* 1943.

WYNNE, FRANCES E. Range Extensions of Mosses in Western North America. BRYOLOGIST **46:** 149–155. *2 fig.* 1943 (1944).

WYNNE, FRANCES E. and W. C. STEERE. The Bryophyte Flora of the East Coast of Hudson Bay. BRYOLOGIST **46:** 73–91. 1943.

UNIVERSITY OF CINCINNATI
CINCINNATI 21, OHIO

X-QK 31
·F8

QK31.F8 #55

(over)

#55

BULLETIN OF THE TORREY BOTANICAL CLUB
Vol. 71, No. 6, pp. 638–654 November, 1944

# SPORELINGS AND VEGETATIVE REPRODUCTION IN THE GENUS CERATOLEJEUNEA*

Margaret Fulford

A taxonomic study of nineteen American species of the hepatic genus *Ceratolejeunea*, just completed,[1] has brought to light several stages of sporeling development in eleven of the American species and one from Java, and examples of vegetative reproduction in eight species. It is, I believe, the first time that sporelings of this genus have been identified, and also the first time that so large a number of sporelings of a genus could be compared. Although the structures of vegetative reproduction have been mentioned in the literature they were never discussed in any detail.

## 1. SPORELINGS

In a recent paper[2] in which several additional types of sporelings were described in the family *Lejeuneaceae*, the question whether the pattern of development was uniform for all of the species had to remain unanswered, since at that time, sporelings of only one species in any of the genera under discussion had been observed. There was also little information on the degree of variation that was to be expected in the numerous sporelings produced by one or several plants of a given species.

It is now fairly certain that the sporeling described and figured by Goebel[3] as belonging to an unknown South American genus, as well as the one described and figured by the writer,[4] as representing a further development of the type discussed by Goebel, belong to the genus *Ceratolejeunea*. These two clearly typify the basic pattern of sporeling development at its best in the genus. It may well be designated the *Ceratolejeunea* type.

The sporeling of the genus *Ceratolejeunea* (except for *C. guianensis*), is made up of a unistratose thalloid portion of two distinct stages: a filament two cells broad and four cells long which develops within the old stretched exospore; and a broader, secondary thallus four cells broad and of indefinite length. The leafy axis develops at the end of this secondary thallus.

* This work was made possible through a Marshall A. Howe Memorial Fellowship given by Mrs. Elon Huntington Hooker to the New York Botanical Garden, for the summer of 1943.

[1] **Fulford, M.** Studies on American Hepaticae—VI. Ceratolejeunea. To be published in Brittonia.

[2] ———. Development of sporelings in the Lejeuneaceae. Bull. Torrey Club **68:** 627–633. *f. 1–4.* 1942.

[3] **Goebel, K.** Organographie der Pflanzen **2:** 907. *fig. 573.* 1930.

[4] **Fulford, M.** Development of sporelings in the Lejeuneaceae. Bull. Torrey Club **68:** p. 631. fig. 3. 1942.

X-OK 31
·F8

X-OK 31 · F8 #56

(over)

#56

BULLETIN OF THE TORREY BOTANICAL CLUB
VOL. 71, No. 6, p. 637 NOVEMBER, 1944

# STUDIES ON AMERICAN HEPATICAE—V. TWO NOMENCLATURAL CHANGES IN CERATOLEJEUNEA

MARGARET FULFORD

The following new species and new combination have resulted from a recent study of the genus *Ceratolejeunea:*

**Ceratolejeunea grandibracteolata** Fulford, sp. nov. *Ceratolejeunea subserrata* Spruce, Hep. Spruc. (not *L.* (*Cerato-Lejeunea*) *variabilis* var. *subserrata* Spruce, Trans. & Proc. Bot. Soc. [Edinburgh] **15**: 207. 1884).

Caules ad 2.5 cm. longi, 1.2 mm. lati, rufobrunnei; folia grandia, oblonga, apice lato, rotundato, integra vel leviter dentata; dente apicali lobuli brevi, curvo, obtuse acuminato; utriculis saepe praesentibus; cellulae 20–24 μ, trigoniis conspicuis, ocellis geminatis, basilaribus; amphigastria grandia, orbicularia: dioica; bracteae femineae lobus late ovatus, lobulo explanato, oblongo, margine integro; bracteolus connatus, late ovatus, bifidus ad partem tertiam longitudinis, margine integro: perianthium emergens, cornibus angustis, brevibus, divaricatis: rami masculi non visi.

**Ceratolejeunea flagelliformis** (Steph.) Fulford, comb. nov. *Ceratolejeunea spinosa* var. *flagelliformis* Stephani, Hedwigia **34**: 238. 1895. *Lejeunea* (*Ceratolejeunea*) *flabelliforme* Stephani. Hepat. in Duss, Muscinées Ant. Franç. 13. 1903 The characters of the perianth, which has only recently been discovered, at once set these plants apart from any of the other American species.

UNIVERSITY OF CINCINNATI
AND
THE NEW YORK BOTANICAL GARDEN

X-QK 31
·F8 #57

Reprinted from THE BRYOLOGIST, Vol. 47, December, 1944.

# RECENT LITERATURE ON HEPATICS

MARGARET FULFORD

BOEHNER, P. A check list of the hepatics of Cattaraugus County, N. Y.—a preliminary survey of the county. [64 sp.] Sci. Stud. St. Bonaventure Coll. **9** (2): 14–16, 28. 1941.

————. The Hepaticae of Cattaraugus County. Sci. Stud. St. Bonaventure Coll. **11** (3): 11–15. 1943.

BUCH, H. Vorarbeiten zu einer Lebermoosflora Fenno-Skandias. IV. Uber *Lophocolea incisa* Lindb. Mem. Soc. Pro Fauna et Flora Fenn. **12:** 148. *2 fig.* 1936.

————. Vorarbeiten zu einer Lebermoosflora Fenno-Skandias. V. *Lophocolea cuspidata* (Nees.) Limpr. neu für Finnland. Mem. Soc. Pro Fauna et Flora Fenn. **12:** 149. 1936.

————. Vorarbeiten zu einer Lebermoosflora Fenno-Skandias. VI. *Scapania paludosa* K. Müll. aus Süd-Finnland. Mem. Soc. Pro. Fauna et Flora Fenn. **12:** p. 149. 1936.

DUTHIE, A. AND S. GARSIDE. Studies in South African Ricciaceae. I. Three annual species: *R. plana* Taylor, *R. cuspidfera* spec. nov. and *R. Curtisii* T. P. James. Roy. Soc. So. Africa Trans. **24:** 99–133. *53 fig. 1 pl.* (1936) 1937.

———— AND ————. Studies in South African Ricciaceae. II. The annual species of the section Riociella (conel.): *R. compacta* sp. nov. and *R. Rautanenii* Steph. *Roy.* Soc. So. Africa Trans. **27:** 17–28. *26 fig. 1 pl.* 1939.

FULFORD, MARGARET. Sporelings and vegetative reproductive structures in *Mastigolejeunea auriculata.* Am. Jour. Bot. **29:** 848–850. 1942.

HEITZ, E. Lebendbeobachtung der Zeilteilung bei *Anthoceros* und *Hymenophyllum.* Deut. Bot. Gesell. Ber. **60:** 28–36. *5 fig.* 1942.

HERZOG, T. Revision der Lebermoosgattung *Leptolejeunea* Spr. in der Indomalaya. Flora [Jena] **35:** 377–434. *30 fig.* 1942.

KNAPP, E. Mutationsauslösung durch ultraviolettes Licht bei dem Lebermoos *Sphaerocarpus donnelii* Aust. Ztschr. f. Induktive Abstam. u. Vererbungslehre **74:** 54–69. *5 tables.* 1938.

MÜLLER, K. Revision der europäischen Arten der Lebermoosgattung *Chiloscyphus* auf Grund des Chromosomensatzes und von Kulturen. Deut. Bot. Gesell. Ber. **59:** 428–436. *1 textabb.* (1941) 1942.

RUIZ, O. M. Estudio de dos especies de Hepáticas encontradas en Itzocan de Matamoros, Pue. [Mex.] Univ. Nac., Inst. de Biol. An. **8:** 397–403. *2 fig.* 1942. [Spanish]

SCHIFFNER, V. Kritische Bemerkungen über die europaischen Lebermoose mit Bezug auf die Exemplare des Exsiccatenwerkes: Hepaticae europaese exsiccatae. Series XXIV, XXV, XXVI, XXVII, 1939, 1940, 1941, 1941.

VOTH, P. Effects of nutrient-solution concentration on the growth of *Marchantia polymorpha.* Bot. Gaz. **104:** 591–601. *3 fig. 3 tables.* 1943.

WALTON, J. How the sperm reaches the archegonium in *Pellia epiphylla.* Nature [London] **152:** 51. 1943.

X-QK 31
.F8 #58

Reprinted from THE BRYOLOGIST, Vol. 48, September, 1945

# RECENT LITERATURE ON MOSSES

MARGARET FULFORD

BARROS, GEORGETTE REIS DE. Notas briológicas. II. Agronomia Lusitana **4:** 155–166. 1942.

BARTRAM, E. B. New and noteworthy Philippine Mosses. Farlowia **1:** 503–513. *28 fig.* 1944. [26 sp., 7 n. sp.]

_____. Additions to the mosses of Fiji. THE BRYOLOGIST **47:** 57–61. *7 fig.* 1944. [15 sp., *Calymperes (Eucalymperes) petiolatum* Bartm. n. sp.]

_____. Henry Neville Dixon. *Ibid.* **47:** 137–144. *Portrait.* 1944 (1945).

BARNHART, J. H. Dates of the "Bryologia Europaea." *Ibid.* **47:** 97–108. 1944.

CONARD, H. S. How to know the mosses. Pp. 1–166. *363 fig.* 1944. Published by H. E. Jaques, Mt. Pleasant, Iowa.

_____. *Brotherella Roellii* (R. & C.) Fleischer. THE BRYOLOGIST **47:** 194–195. *1 fig.* 1944 (1945).

KÜHNEMANN, O. Géneros de briofitas de los alrededores de Buenos Aires. Contribución morfológica y sistemática. [hepatics and mosses] Lilloa **10:** 5–232. *91 fig. 12 maps.* 1944.

LEE, L. W. Some bryophytes of Greenland. THE BRYOLOGIST **47:** 114–118. 1944. [32 species]

MOXLEY, E. A. Moss notes from Ontario. *Ibid.* **47:** 113. 1944.

SATRE, GENEVA. Colorado species of *Grimmia*. *Ibid.* **47:** 118–122. 1944. [key to 27 sp. and var.]

SCHREIBER, H. Zur Frage des biologischen Wirkungsmechanismus der Strahlung. Naturwissens. **29:** 669–670. 1941.

SHARP, A. J. Notes on interesting bryophytes of the southern Appalachians. IV. Castanea **9:** 106–108. 1944. [6 mosses new to Tennessee; *Homaliodelphus Sharpii* comb. nov.]

_____. Some problems in American bryology. Lilloa **10:** 265–283. 1944.

_____. Review: Cain, Stanley A. Foundations of Plant Geography. New York. 1944. THE BRYOLOGIST **47:** 134–135. 1944.

STEERE, W. C. Instructions to naturalists in the Armed Forces for Botanical Field Work. No. 3. The Collecting of Mosses and Liverworts. Published for Company D, 3651, S. U., Dept. Botany, Univ. Mich.

WELCH, WINONA. Studies in Indiana bryophytes. V. Indiana Acad. Sci. Proc. **52:** 52–57. *28 fig.* 1942 (1944).

_____. Memories of H. N. Dixon. THE BRYOLOGIST **47:** 145–146. 1944 (1945).

WETTSTEIN, F. v. und J. STRAUB. Experimentelle Untersuchungen zum Artbildungs-problem. III. Weitere Beobachtungen an polyploiden Bryum-Sippen. Zeitschr. Indukt. Abstamm.-u. Vererbungsl. **80:** 271–280. 1942.

WYNNE, FRANCES E. Methods of reporting plant distribution data. Chronica Botanica **7, 8:** 426–428. 1943.

_____. Studies in *Drepanocladus*. II. Phytogeography. Amer. Midland Nat. **32:** 643–668. *7 maps.* 1944.

_____. Studies in *Drepanocladus*. III. Doubtful and excluded names. THE BRYOLOGIST **47:** 66–78. 1944.

_____. Studies in *Drepanocladus*. IV. Taxonomy. *Ibid.* **47:** 147–189. *10 pl. 5 maps.* 1944 (1945).

UNIVERSITY OF CINCINNATI

X-QK 31
.F8

X-QK 31.F8 #89

Vol. 5, No. 4, pp. 368–403 BRITTONIA November 12, 1945

# STUDIES ON AMERICAN HEPATICAE—VI. CERATOLEJEUNEA

Margaret Fulford

X-QK 31
.F8 #60

Reprinted from THE BRYOLOGIST, Vol. 49, March, 1946

# RECENT LITERATURE ON HEPATICS

MARGARET FULFORD

BLOMQUIST, H. L. Review: Frye, T. C. and Lois Clark, Hepaticae of North America. Part II. Washington [State] Univ. Publ. **6**: 163–336. 1943. THE BRYOLOGIST **47**: 43–44. 1944.

CLARK, LOIS and RUTH DOWELL SYIHLA. *Porella arborea*. THE BRYOLOGIST **47**: 36–40. *28 fig.* 1944.

———. *Porella swartziana*. *Ibid.* **47**: 62–66. *35 fig.* 1944.

———. *Frullania brasiliensis*. *Ibid.* **47**: 108–112. *34 fig.* 1944.

———. *Frullania inflata*. *Ibid.* **47**: 196–199. *19 fig.* 1944 (1945).

CLEE, D. A. The morphology and anatomy of *Fegatella conica* in relation to the mechanism of absorption and conduction of water. Ann. Bot. [London] **7**: 185–193. *4 fig.* 1943.

FLOWERS, S. Utah hepatics. THE BRYOLOGIST **48**: 8–11. 1945. [37 species.]

FRYE, T. C. and LOIS CLARK. Hepaticae of North America. II. *Haplomitrium–Plectocolea*. Washington [State] Univ. Publ. Biol. **6** (2): 163–336. [*Illus.*] 1943.

———. Hepaticae of North America. III. *Lophozia–Dichiton*. Washington [State] Univ. Publ. Biol. **6** (3): 337–564. [*Illus.*] 1945.

FULFORD, MARGARET. Sporelings and vegetative reproductive structures in *Archilejeunea*. THE BRYOLOGIST **45**: 173–175. *20 fig.* 1942.

———. Vegetative reproduction in *Porella pinnata* L. *Ibid.* **47**: 78–81. *17 fig.* 1944.

———. Studies on American Hepaticae V. Two nomenclatural changes in *Ceratolejeunea*. Bull. Torrey Club **71**: 637. 1944.

———. Sporelings and vegetative reproduction in the genus *Ceratolejeunea*. *Ibid.* **71**: 638–654. *Fig. A–J & 1–72.* 1944.

HAUPT, A. W. Multiple eggs in *Symphyogyna*. THE BRYOLOGIST **46**: 139–141. *4 fig.* 1943.

HERZOG, T. *Byssolejeunea*, eine neue Gattung der Lejeuneaceae. Hedwigia **80**: 84–86. *1 fig.* 1941.

———. *Alikomia* Herz., eine neue Gattung der Haplolaenaceae. Hedwigia **80**: 77–83. *2 fig.* 1941.

HODGSON, E. A. Review of the New Zealand species of *Schistochila*, with notes on Colenso's species. Trans. & Proc. Roy. Soc. New Zealand **71**: 181–194. *2 pl.* 1941.

———. A review of the New Zealand species of the genus *Chiloscyphus*. *Ibid.* **73**: 27–52. *20 fig.* 1943. [27 sp.; 1 n. sp., 1 n. comb.]

———. A review of the New Zealand species of *Plagiochila*. *Ibid.* **73**: 270–296. *23 fig.* 1944.

KHANNA, L. P. On two new species of *Megaceros* with notes on *M. arachnoideus*, *M. denticulatus*, *M. giganteus*, and *M. grandis*. Farlowia **1**: 515–523. *20 fig.* 1944.

MARTIN, J. N. Some of the available hepatics and their location in the vicinity of Iowa State College. Proc. Iowa Acad. Sci. **50**: 229–234. *pl.* 1, 2. 1943 (1944).

MÜLLER, K. Beiträge zur Systematik der Lebermoose. II. Hedwigia **80**: 90–118. *9 textabb.* 1941.

PANDE, S. K. & R. N. MISRA. Studies in Indian Hepaticae. II. On the epiphyllous liverworts of India and Ceylon. Jour. Indian Bot. Soc. **22**: 159–169. *47 fig.* 1943.

PARKER, DOROTHY. Additions to the Hepaticae of Indiana. II. Indiana Acad. Sci. Proc. **52**: 96. 1942 (1944).

RICHARDS, P. W. The taxonomy of British bryophytes as a field for research. Nature **155**: 100. 1945.

SCHIFFNER, V. Eine neue Gattung der Lejeuneaceae. [*Heterolejeunea*] Hedwigia **80**: 87–89. *1 textabb.* 1941.

X-QK 31
·F8 #61

Reprinted from THE BRYOLOGIST, Vol. 49, September, 1946

# RECENT LITERATURE ON MOSSES

MARGARET FULFORD

ALLORGE, VALIA. Au sujet du *Sphagnum molle* Sull. en Espagne et de sa variété *limbatum* Wst. dans les Landes. Trav. Bryol. [Mus. Nat. Hist. Nat. Paris] **2:** 163–167. *3 fig.* 1944.

ANDREWS, A. L. Taxonomic Notes. IV. *Sciaromium Lescurii.* THE BRYOLOGIST **48:** 100–103. 1945.

———. Taxonomic Notes. V. The genus *Tetrapterum.* THE BRYOLOGIST **48:** 190–193. 1945.

BARTRAM, E. B. Pacific Outpost mosses. THE BRYOLOGIST **48:** 45–53. 1945. [n. spp. = *Ectropothecium ponapense, E. diversirete, Pseudoracelopus armatus*]

———. A new *Weisia* and a new *Tortula* from southwestern United States. THE BRYOLOGIST **48:** 90–92. *fig. A-N.* 1945 [n. spp.: *W. Sweetii, T. californica*]

———. Mosses of Morobe District, northeast New Guinea. THE BRYOLOGIST **48:** 110–126. 1945 [n. spp.: *Campylopus (Palinocrasipis) morobensis, Cryptodicranum Armiti* (C. M.) Bart. var. *fragilifolium, Dicnemon robustum, Anoectangium magnirete, Tortula novo-guinensis, Bryum perrevolutum, Brachymenium nepalense* Hook. var. *globosum, Ulota angusti-limbata, Macromitrium (Gomiostoma) sublongicaule, M. (Leiostoma) morobense, M. hamatum, Floribundaria (Trachycladiella) crispata, Calyptothecium alar, Chaetomitrium subplicatum, Rhynchostegiella stellata, Aptychella Clemensiae, Meiothecium crispum, M. (Eumeiothecium) longisetum, Ectropothecium perplicatum*].

BIMONT, G. Excursion bryologique à la tourbière de la Cailleuse (forêt de Montmorency, Seine-et-Oise). Trav. Bryol. [Mus. Nat. Hist. Nat. Paris] **2:** 114–117. 1944.

CONARD, H. S. The decurrent leaves of *Didymodon tophaceus.* THE BRYOLOGIST **48:** 27–28. *1 fig.* 1945.

———. *Gyroweisia reflexa* in North America. THE BRYOLOGIST **48:** 28–29. 1945.

———. The Foray at Columbus, Ohio, September, 1944. THE BRYOLOGIST **48:** 42–44. 1945.

———. A moss fountain. Nature Mag. **39:** 192. *photograph, figs.* 1946.

CONARD, H. ET AL. The bryophyte herbarium. A moss collection: preparation and care. THE BRYOLOGIST **48:** 198–202. *fig. 1–2.* 1945.

CARROLL, GLADYS. The bryophytes of the Appalachian Plateau in northern Georgia. THE BRYOLOGIST **48:** 11–24. *1 map.* 1945. [46 hepaticae, 94 mosses]

DEMARET, F. Le genre *Andreaea* en Afrique centrale et orientale. Brussels Jard. bot. de l'État Bull. **17:** 33–48. *12 fig.* 1943.

DUCLOS, P. ET L. LAVERGNE. La végétation bryologique de la Châtaigneraie du Cantal. Trav. Bryol. [Mus. Nat. Hist. Nat. Paris] **2:** 58–80. 1944.

ERNST-SCHWARZENBACH, MARTHE. La sexualité et le dimorphisme des spores des mousses. Trav. Bryol. [Mus. Nat. Hist. Nat. Paris] **2:** 105–113. *7 fig.* 1944.

X-UA
·F8 #62

Reprinted from THE BRYOLOGIST, Vol. 49, December, 1946

# RECENT LITERATURE ON MOSSES

MARGARET FULFORD

ALLORGE, P. Quelques observations sur le *Tortula desertorum* Broth., mousse aralo-caspienne des plateaux castillans. Jour. Inst. Bot. Acad. Sci. Ukraine *18–19* (26–27): 287–288. 1938.

———. Muscinées du Pays basque. Soc. bot. France Bull. **88:** 210–219. 1941.

———. Une reconnaissance bryologique dans la forêt d'Irati (Basses-Pyrénées). Soc. Bot. France Bull. **88:** 219–225. 1941.

BARTRAM, E. B. Additions to the moss flora of northern Chile. Trav. Bryol. [Mus. Nat. Hist. Nat. Paris] **1:** 131–134. *2 fig.* 1942. [sp. nov.: *Orthotrichum Johnstonii*, *Hygroamblystegium crassicostatum*]

BIZOT, M. Contribution à la flore bryologique du Liban. Trav. Bryol. [Mus. Nat. Hist. Nat. Paris] **1:** 49–53. 1942.

BUCH, H. Deux mousses critiques de la Péninsule ibérique. Trav. Bryol. [Mus. Nat. Hist. Nat. Paris] **1:** 45–48. 1942.

BUCH, H. AND H. PERSSON. Bryophyten von den Azoren und Madeira. Finska Vetensk. Soc. Comm. Biol. **VIII** (7): 1–16. 1941.

CHEVALIER, A. Souvenirs de jeunesse sur T. Husnot. Trav. Bryol. [Mus. Nat. Hist. Nat. Paris] **1:** 1–9. 1942.

DEMARET, F. Muscinées récoltées dans le Jurassique belge au cours de l'herborisation de la Société Royale de Botanique de Belgique les 19 et 20 Juin 1937. Soc. Roy. de Bot. de Belg. Bull. **70:** 141–147. 1937–1938.

———. Prodrome des bryophytes du Congo Belge et du Ruanda-Urundi. I. Musci. Brussels Jard. Bot. de l'État Bull. **16:** 21–104. 1940. [414 sp. and var.]

———. *Dicranella cerviculata* Schpr. f. *saxicola* Card. en Belgique. Trav. Bryol. [Mus. Nat. Hist. Nat. Paris] **1:** 83–85. *2 fig.* 1942.

———. Revision des espèces Belges de *Sphagnum* Dill. Sous-section *Cymbifolia* Lindb. Brussels Jard. Bot. de l'État Bull. **16:** 267–286. *21 fig.* 1941–1942.

DIXON, H. N. Some new Japanese mosses. Trav. Bryol. [Mus. Nat. Hist. Nat. Paris] **1:** 10–19. 1942. [sp. nov. *Rhabdoweisia gymnostomoides* Dix. et Thér., *Holomitrium ebracteatum* Dix., *Astomum acuminatum* Dix. et Thér., *Weisiopsis hyophiloides* Dix. et Thér., *Bartramia perangusta* Dix. et Thér., *Drummondia flexifolia* Dix. et Thér., *Doxya breviseta* Dix., (?) *Cladomniopsis japonica* Dix. et Thér., *Trachypus obtusus* Dix. et Thér., *Floribundaria unipapillata* Dix., *Calyptothecium enerve* Dix., *Distichophyllum sikokuense* Dix., *D. acutifolium* Dix., *Hypopterygium Sasaokae* Dix., *H. acuminatum* Dix., *Homalothecium pilosissimum* Dix. et Thér., *Gollania cochlearifolia* Broth., *G. subcochlearifolia* Dix. et Thér., *G. bipinnata* Dix., *G. perundulata* Dix., *G. rhynchostegioides* Dix. et Thér., *Macrothamnium longirostre* Dix.]

DUVIGNEAUD, P. Remarques sur la végétation des grottes de Han. Soc. Roy. de Bot. de Belg. Bull. **70:** 120–129. 1938.

———. Les associations épiphytiques de la Belgique. Soc. Roy. de Bot. de Belg. Bull. **74:** 31–53. 1941–1942. [mosses, hepatics and lichens]

GYÖRFFY, I. Ueber Oikologie und Artrecht von *Philonotis Schliephackei* Roell. Trav. Bryol. [Mus. Nat. Hist. Nat. Paris] **1:** 96–103. *1 fig.* 1942.

HAUMAN, L. Les bryophytes des hautes altitudes au Ruwenzori. Brussels Jard. Bot. de l'État. Bull. **16:** 311–354. 1942.

HILLIER, L. Notules bryologiques. Trav. Bryol. [Mus. Nat. Hist. Nat. Paris] **1:** 63–65. 1942.

LATZEL, A. Die Grottenmoose von Postumia (Italien). Trav. Bryol. [Mus. Nat. Hist. Nat. Paris] **1:** 66–70. 1942.

X-OK 31
.F8 #63

Reprinted from THE BRYOLOGIST, Vol. 50, March, 1947

# RECENT LITERATURE ON HEPATICS

MARGARET FULFORD

ALLORGE, P. Le *Telaranea nematodes* dans les Pyrénées basques. Soc. Bot. de France Bull. **86:** 425–426. 1939.

ALLORGE, VALIA ET P. ALLORGE. Sur la répartition et l'écologie des hépatiques epiphylles aux Açores. Soc. Broteriana Bol. **13:** 211–231. *2 pl.* 1938.

———. Sur la présence d'hépatiques épiphylles aux Iles Açores. [Paris] Acad. des Sci. Compt. Rend. **206:** 1323. 1938.

BERGHEN, C. et P. Duvigneaud. Catalogue des hépatiques de la flore belge. Soc. Roy. de Bot. de Belg. Bull. **75:** 87–99. 1943.

BOROS, A. Ueber einige interessante Lebermoose des historischen Ungarn. Trav. Bryol. [Mus. Nat. Hist. Nat. Paris] **1:** 36: 41. 1942.

———. Nachträge zum Artikel: "Über einige interessante Lebermoose aus Ungarn." Trav. Bryol. [Mus. Nat. Hist. Nat. Paris] **2:** 160. 1944.

CHADEFAUD, M. Essai sur la valeur morphologique de la sporangiale des Bryophytes. Trav. Bryol. [Mus. Nat. Hist. Nat. Paris] **1:** 71–82. *fig. 1–14.* 1942.

CHALAUD, G. *Pilya Frullaniae* nov. sp., Discomycète parasite de *Frullania dilatata* Dum. Trav. Bryol. [Mus. Nat. Hist. Nat. Paris] **1:** 117–120. *8 fig.* 1942.

CLARK, LOIS AND T. C. FRYE. *Frullania cucullata.* THE BRYOLOGIST **48:** 53–56. *figs. 1–20.* 1945.

———. *Jubula pennsylvanica.* THE BRYOLOGIST **48:** 127–130. *figs. 1–20.* 1945.

CLARK, LOIS AND RUTH D. SYIHLA. *Frullania riojaneirensis.* THE BRYOLOGIST **48:** 56–59. *figs. 1–16.* 1945.

———. *Frullania atrata.* THE BRYOLOGIST **48:** 187–189. *figs. 1–20.* 1945.

DAVY DE VIRVILLE, A. Recherches sur le parasitisme chez les muscinées. Rev. Gén. de Bot. **49:** 5–34. *3 pl. 15 fig.* 1937.

DEMARET, F. Prodrome des bryophytes du Congo belge et du Ruanda-Urundi, II. Hepaticae. Brussels Jard. Bot. de l'État. Bull. **16:** 287–310. 1942. [140 species]

DUVIGNEAUD ET C. V. BERGHEN. Hépatiques rares ou nouvelles pour la flore belge. Soc. Roy. de Bot. de Belg. Bull. **75:** 100–102. 1943.

FULFORD, MARGARET. Studies in American Hepaticae. VI. *Ceratolejeunea.* Brittonia **5:** 368–403. *126 fig.* 1945.

GAMS, H. Beiträge zur Kenntnis der nivalen Lebermoose der Alpen. Trav. Bryol [Mus. Nat. Hist. Nat. Paris] **2:** 34–42. 1944.

HÉE, A. La végétation hépaticologique d'un coin de vallon vosgien. Trav. Bryol. [Mus. Nat. Hist. Nat. Paris] **1:** 121–129. 1942.

HERZOG, TH. Eine neue *Plagiochila*-Art auf den Azoren. Trav. Bryol. [Mus. Nat. Hist. Nat. Paris] **2:** 161–162. 1944. [n. sp. *P. Allorgei* Herz. & Perss.]

———. Drei neue *Ceratolejeunea*-Arten der Neotropis. Trav. Bryol. [Mus. Nat. Hist. Nat. Paris] **1:** 20–24. *2 fig.* 1924. [n. sp. *C. sacculosa, C. littoralis, C. globulifera*]

MEYLAN, CH. Localités nouvelles pour la flore des muscinées de la Suise. Soc. Vaud. des Sci. Nat. Bull. **60:** 261–276. 1939.

MÜLLER, K. Die Lebermoose (Musci Hepatici) Rabenhorst's Kryptogamen Flora. VI Bd. Ergänzungsband. Lief. 1, 160 p., *28 fig.* Leipzig. Akadem. Verlagsges. 1939–1940.

NICHOLSON, W. E. Some Hepatics from the Hawaiian Islands. Trav. Bryol. [Mus. Nat. Hist. Nat. Paris] **1:** 142–144. 1942.

TRABUT. L. (posthumus) Flore des hépatiques de l'Afrique du Nord. Mélanges Bryol. et Lichén. [Paris] pp. 1–43. 1941–42.

UNIVERSITY OF CINCINNATI

·F3 #64

Reprinted from THE BRYOLOGIST, Vol. 50, June, 1947

# LEUCOLEJEUNEA CLYPEATA—ITS HABIT AND STRUCTURE[1]

MARGARET FULFORD[2]

(with 38 figures)

*Leucolejeunea clypeata* (Schwein.) Evans is known throughout the eastern United States from Massachusetts and New York south to Florida and Louisiana (Evans 1902, p. 122, *pl. 16, f. 1–11;* 1907b, p. 227). It is a member of a small genus of perhaps a half-dozen species, most of which are tropical and subtropical in distribution. The plants are pale green, often glaucous, and grow in broad, depressed mats on trees and rocks in moist woods. The individual plants may be to 3 cm. long, and with leaves to 1.5 mm. broad, and are irregularly branched. The branching is terminal, that is, from a portion of a young segment of the apical cell rather than from a more or less ma-

[1] This research was made possible through a grant from the Research Funds of the American Philosophical Society; see Yearbook, 1944: 169–170.
[2] I wish to acknowledge my indebtedness to Dr. A. W. Evans of Yale University for his kind assistance in the interpretation of certain of the structures and the detail of their development.

.F8

Reprinted from THE BRYOLOGIST, Vol. 50, June, 1947

# THE REACTION OF LEUCOLEJEUNEA CLYPEATA TO VARIATIONS IN DOSAGE OF SOFT X RAYS*

MARGARET FULFORD AND HAROLD KERSTEN

These experimental samplings were made, first of all to determine the maximum dosage of soft X rays to which these plants can be subjected without lethal effects, and in the second place, to see what sort of reactions, if any, result from exposure to these radiations.

Plants of *Leucolejeunea clypeata* were irradiated with soft X rays for varying lengths of time and at 3 different distances from the focal spot of the X-ray tube. The X rays were produced by a copper, gas X-ray tube,[1] operating at 30 peak kv. and 10 m. a.

In addition, plants of this species were irradiated in such a manner that only a part of each stem was exposed, in order to see whether in these plants of comparatively simple structure, the effects were passed on from one part of the stem to another.

All the plants were grown in Petri-dish cultures (12 plants each), already described in detail and figured in another paper, and were given the full nutrient solution described by Voth and Hamner.[2] They were kept in the light cabinet, and on the top shelf (see previous papers for description and figures).

During the time that the cultures were being irradiated a disc of partially fused glass wool served as the support for the glass tape on which the plants were growing, instead of the open, glass rod frame (see Plate 12). This assured a constant and adequate supply of moisture and prevented drying of the plants under these extreme conditions.

The plants of each of the cultures used in Experiments I, II and III were arranged in two groups of 6 plants each, on the glass tape, and the plants of one group were irradiated, while those of the other group, covered with a lead sheet during the time of exposure, served as the control. The results are shown in the Tables below.

* This research was made possible through a grant from the Research Funds of the American Philosophical Society; see Year Book, 1944: 169–170.

[1] KERSTEN, H. A. 1934. Gas X-ray tube for irradiation with soft X rays. Radiology 23: 60–63.

[2] VOTH, PAUL AND KARL HAMNER. 1940. Response of *Marchantia polymorpha* to nutrient supply and photoperiod. Bot. Gaz. 102: 169–205. *14 fig.*

·F8 = 66

Reprinted from THE BRYOLOGIST, Vol. 50, June, 1947

# THE RESPONSE OF LEUCOLEJEUNEA CLYPEATA TO VARIATIONS IN THE NUTRIENT SOLUTION[1]

MARGARET FULFORD, GLADYS CARROLL AND THOMAS COBBE[2]

In general, leafy liverworts are considered to be very difficult if not impossible materials for experimental work of any sort,[3] not only because of their small size and very slow rate of growth, but also because of the difficulties involved in keeping cultures free from the algae and fungi with which they are always contaminated under natural conditions. On the other hand, because of their relatively simple structures and the relatively small number of cells involved, they show great promise as materials for fundamental research.

Although there are a creditable number of studies which have considered the nutrient requirements of hepatics, a closer inspection of these soon shows that the majority of them have had to do with the members of the thalloid group (for literature see Garjeanne, 1932, p. 297; Müller, 1939, p. 154; Voth and Hamner, 1940, p. 203), and that there are only a very few in which the leafy hepatics have been the subject of investigation (see Buch, 1919; 1920; 1921; 1923, p. 73; 1933, p. 7). There is very little specific information concerning suitable methods for the culture of members of this latter group under controlled conditions, and very little information concerning the effects of various nutrients on their general appearance and behavior. Yet it is these leafy members which make up the dominant group of the Hepaticae, since they comprise more than 85 per cent of the total (8500 species).

The following studies were undertaken to determine, first, a method for growing leafy liverworts successfully in the laboratory, and second, to determine the effect of variations in the nutrient environment on plants of one species, particularly with respect to its gross characteristics, that is, those characters most likely to be used in the taxonomic evaluation of a species. Several methods of culture were tried.

[1] This research was made possible through a grant from the Research Funds of the American Philosophical Society; see Year Book, 1944: 169–170.

[2] We wish to acknowledge the generous assistance of Mr. Alfred Cobbe and Dr. Harold Kersten in the preparation of the experiments; and the kindness of Dr. J. H. Hoskins in reading the manuscript. We also wish to thank the New York Botanical Garden for providing facilities for work during the summer.

[3] Garjeanne, in discussing the physiology of bryophytes in the "Manual of Bryology," Chapter VIII, says, "In most cases the tufts of mosses and especially of liverworts taken from their natural substratum in to the laboratory and cultivated *in vitro*, either dry out or become covered with mold after a few days. Though it is sometimes possible to grow them for a shorter or longer period, in the end they always die."

QK31
.M6

WITH THE COMPLIMENTS OF
Harold N. Moldenke

X-QK31.M6 #67

(over)

#67

BULLETIN OF THE TORREY BOTANICAL CLUB
Vol. 74, No. 5, pp. 378–382 September, 1947

# SUPPLEMENTARY NOTES ON AMERICAN MENISPERMACEAE—IV

B. A. Krukoff and H. N. Moldenke

Extensive collections of the Menispermaceae, largely from Amazonian Brazil, have recently become available to us. The collections examined extend our knowledge of certain species previously known to us from incomplete material; extensions of ranges are noted for a considerable number of species, and one species, *Abuta Soukupi* Moldenke, is described as new. No changes in nomenclature are necessitated.

The species are arranged in the same order and the place of deposit of specimens is shown by the same abbreviations as in our previous papers (1, 2, 3, 4, 5). The following new abbreviations are used:

DS: Dudley Herbarium, Stanford University, California.

IAN: Instituto Agronômico do Norte, Pará, Brazil.

MPU: Institut Botanique de l'Université de Montpellier, France.

### Chondodendron Ruiz & Pavon

1. Chondodendron microphyllum (Eichl.) Moldenke. Additional specimens examined: Brazil—Bahia: *Curran 541* (G); basin of Rio Pardo, *Froes 12686, 12689a;* basin of Rio Santa Ana, *Froes 12701.*

2. Chondodendron platiphyllum (A. St. Hil.) Miers. Additional specimens examined: *Esc. Sup. Agr. & Vet. s.n.* (*Kr. Herb. 17734*).

3. Chondodendron tomentosum Ruiz & Pav. Additional specimens examined: Ecuador—Oriente: Rio Yatape Pacayaco, alt. ± 580 met., *Gill I* (DC). Peru—San Martin: San José de Ciza, *Massey s.n.*

5. Chondodendron limaciifolium (Diels) Moldenke. Additional specimens examined: Brazil—Amazonas: basin of the upper Jurua, munic. Eirunepé, *Froes 21700, ? 21709, 21710, 21711, 21776, ? 21785, ? 21794.*

The first record of the species from the basin of Rio Jurua.

7. Chondodendron toxicoferum (Wedd.) Krukoff & Moldenke. Additional specimens examined: Colombia—Amazonas: near Leticia, *Grassl 10076, Hermann 11309* (W.). Putamayo: Rio San Miguel ó Sucumbios, *Schultes 3522.* Peru—Iquitos: *Rosengarten I.* Brazil—Amazonas: basin of the upper Jurua, munic. Eirunepé, *Froes ? 21734, ? 21756, ? 21763, ? 21770, 21802a, 21836.*

The first record of the species from Colombia. The vernacular name "sa-pé-pa" for the species is recorded by Schultes, who also notes on his label that "the wood of stem crushed to make curare poison."

### Sciadotenia Miers

2. Sciadotenia paraënsis (Eichl.) Diels. Additional specimens examined: Brazil—Pará: near Belém, *Murça Pires & Black 531.*

K-OK.31
.M6 #58

WITH THE COMPLIMENTS OF
*Harold N. Moldenke*

# PHYTOLOGIA

*Designed to expedite botanical publication*

Vol. 2 November, 1947 No. 9

CONTENTS

VAN MELLE, P. J., *From texts to plants—or from plants to texts?* ..... 353

MOLDENKE, H. N., *Notes on new and noteworthy plants. III* ..... 363

MOLDENKE, H. N., *The known geographic distribution of the members of the Eriocauleaceae. Supplement 2* ..... 372

MOLDENKE, H. N., *The known geographic distribution of the Verbenaceae, Avicenniaceae, Stilbaceae, and Symphoremaceae. Supplement 7* ..... 382

MOLDENKE, H. N., *Additional notes on the genus Aegiphila. VIII* ..... 387

Published by H. A. Gleason and Harold N. Moldenke
The New York Botanical Garden,
Bronx Park, New York 58, N. Y.

Price of this number, 50 cents; per volume, $5.00 in advance

Vol. 2, No. 8, was issued June 30, 1947

WITH THE COMPLIMENTS OF
Harold N. Moldenke

QK 31
M6

X-QK 31. M6 #69

# A LIST SHOWING THE LOCATION OF THE PRINCIPAL COLLECTIONS OF VERBENACEAE, AVICENNIACEAE, STILBACEAE, SYMPHOREMACEAE, AND ERIOCAULACEAE, SUPPLEMENT 1

H. N. MOLDENKE

QK 31
.M6

REPRINTS AND SUPPLEMENTS OF
Harold N. Moldenke

X-QK31.M6 #10

# AN ALPHABETIC LIST OF INVALID AND INCORRECT SCIENTIFIC NAMES PROPOSED IN THE VERBENACEAE, AVICENNIACEAE, STILBACEAE, AND SYMPHOREMACEAE, INCLUDING VARIATIONS IN SPELLING AND ACCREDITION. SUPPLEMENT 1

H. N. MOLDENKE

X-QK 31
M6

Reprinted from the American Journal of Botany, Vol. 38, No. 5, 321-327, May, 1951
Printed in U. S. A.

Harold N. Moldenke

# VERBENACEOUS NOVELTIES FROM AFRICA AND SOUTH AMERICA[1]

Harold N. Moldenke

4 11 52

Continued work in the herbarium of the New York Botanical Garden and on several thousand specimens received on loan from the Muséum National d'Histoire Naturelle in Paris, has brought to light the following novelties here described for the first time:

**Clerodendrum bellum** Moldenke, sp. nov.—Frutex 3–4 m. altus; ramulis sarmentisque gracilibus obtuse tetragonis valde lenticellatis griseis glabris; foliis oppositis vel approximatis; petiolis usque ad 1 cm. longis glabris; laminis foliorum subcoriaceis ellipticis vel obovatis acutis vel breviter acuminatis integris, ad basim acutis, utrinque glabris nitidisque; inflorescentiis axillaribus vel subterminalibus plerumque 1-floris; pedunculis valde abbreviatis glabris; pedicellis brunnescentibus 3 cm. longis glabris; calyce subcoriaceo obconico-tubuloso.

Shrub, 3–4 m. tall; branchlets and twigs slender, obtusely tetragonal, often compressed at the nodes, prominently lenticellate, gray or grayish, glabrous; nodes not annulate; principal internodes much abbreviated on twigs, elongated to 10 cm. or more on vigorous shoots; leaves decussate-opposite or approximate; leaf-scars large and prominent; petioles stoutish, 2–10 mm. long, glabrous; leaf-blades subcoriaceous, uniformly very light-green on both surfaces, not at all brunnescent, elliptic or obovate, 4–10.5 cm. long, 1.6–5.5 cm. wide, acute or short-acuminate at the apex, entire, acute at the base, glabrous and shiny on both surfaces; midrib stoutish, flat or subimpressed above, rounded-prominent beneath; secondaries slender, 2–4 per side, very irregular and distant, subimpressed above, mostly not at all prominulous beneath, very irregularly joined near the margins; veinlet reticulation very sparse, mostly obscure on both surfaces; inflorescence axillary or subterminal, mostly 1-flowered, sometimes 2-flowered; peduncles much abbreviated, mostly 5–7 mm. long, glabrous; pedicels stout, brunnescent, about 3 cm. long, glabrous; bractlets and prophylla absent or caducous; calyx subcoriaceous, obconic-tubular, 4–6 cm. long, 1–1.5 cm. wide, not plainly venose, glabrous, its rim deeply 5-lobed, the lobes ovate, erect, firm, 10–12 mm. long attenuate-acute and subulate-apiculate; corolla infundibular, rose, its tube narrow-cylindric, about 12 cm. long, infundibular-ampliate only at the apex, glabrous, the lobes obovate, about 3 cm. long and 2.5 cm. wide, rounded, glabrous on both surfaces, subequal; stamens and pistil exserted about 2 cm. from the corolla-mouth; filaments glabrous; anthers oblong, about 5 mm. long; style glabrous; stigma bifid, its branches about 2 mm. long.

[1]Received for publication June 10, 1950.

The type of this handsome species was collected by Henri Perrier de la Bâthie (*No. 10250*) in wet woods, altitude 1500 m., at Manankuzo, northeast of Ankazobe, Madagascar, in September 1913, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

**Clerodendrum brunnescens** Moldenke, sp. nov.—Frutex epiphyticus simplex vel parce ramosus; caulibus ramisque compresso-tetragonis valde lenticellatis glabris; internodiis valde abbreviatis; foliis oppositis; petiolis crassis nigrescentibus glabris; laminis membranaceis brunnescentibus ellipticis acutis vel subcuspidato-acuminatis integris, ad basim acutis vel acuminatis, utrinque glabris vel subglabratis, subtus nigro-glandulosis; inflorescentiis terminalibus cymosis pauciforis.

Epiphytic shrub, about 4 dm. tall, simple or sparsely branched; stems and branches medium-stoutish, compressed-tetragonal, prominently lenticellate, glabrous; nodes not annulate; principal internodes very much abbreviated, 0.5–2.3 cm. long; leaf-scars very large and prominent; leaves decussate-opposite; petioles stout, nigrescent, 1–2 cm. long, glabrous; blades membranous, brunnescent in drying, elliptic, 9–19 cm. long, 5–9 cm. wide, acute or very slightly short-cuspidate-acuminate at the apex, entire, acute or acuminate at the base, glabrous or subglabrate on both surfaces, more or less black-glandular on the lamina along the midrib beneath; midrib slender or stoutish, flat above, very prominent beneath; secondaries very slender, 6–9 per side, arcuate-ascending, flat above, prominulent beneath, arcuately joined near the margins beneath; vein and veinlet reticulation sparse, indiscernible above, only the larger parts prominulous beneath; inflorescence terminal, cymose, few-flowered; peduncles obsolete; cyme-branches flattened, nigrescent, peduncle-like, 2.5–3.5 cm. long, glabrous; pedicels slender, flattened, nigrescent, 3–4 mm. long, glabrous; foliaceous bracts absent; bractlets and prophylla linear-setaceous, 2–7 mm. long, nigrescent, glabrous; calyx subcoriaceous, obconic, nigrescent, 3–4 cm. long, 1–1.3 cm. wide, glabrous, not at all venose, its rim deeply 5-lobed, the lobes ovate, erect, firm, about 8 mm. long, attenuate-acute; corolla not known.

The type of this unique species was collected by Henri Perrier de la Bâthie (*No. 10240*) in the forest in the vicinity of Analamazoatra, Madagascar, in January 1932, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris.

**Clerodendrum comans** Moldenke, sp. nov.—Frutex vel arbor; ramulis gracillimis obtuse tetragonis densissime fulvo-tomentellis vel breviter pubescentibus; foliis oppositis; petiolis gracillimis

X-QK 31
.M6

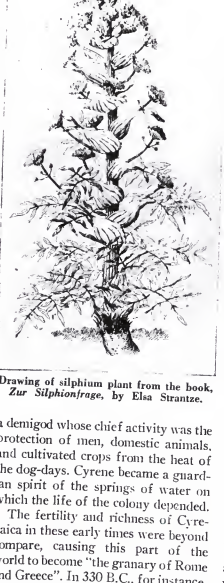
X-QK31.1 c.1 #72

# THE MYSTERIOUS SILPHIUM

By Harold N. and Alma L. Moldenke

N the Mediterranean shores of northeastern Africa lies the section land known as Cyrenaica, with area that has varied from 75,340 to ,000 square miles (the larger area ig that of the modern province) with a present population of ,000 to 250,000 inhabitants. It is part of the United Nations teeship territory of Libia, lying be- en the Libian Desert on the east Tunisia and the Sahara Desert on west. Between its capital city, Ben- (at the western end of Cyrenaica) Tobruch (at the eastern end) lies site of the ancient city of Cyrene ene). This was one of the five cities that gave to the region the of "Pentapolis" in ancient times. ll into final ruins in Moham- nes and its site is now mark- the village of Grenne (Ghrennah urin).

ie Berbers appear to have been the nal inhabitants of the area. They gradually pushed back from the e coastal strip into the barren tains of the south by various gn invaders, the first of which the Therian Greeks who, in 631 , under Battus, "the stammerer" Aristoteles, as he is sometimes ), founded the city of Cyrene. s located on the Jebel Akhdar nd at an altitude of 1,800 feet, een miles back of the coast. tus, who had been instructed by elphic oracle to found a colony place between waters", had first an unsuccessful attempt on an ore island. He had then been led friendly natives to this main- te where the many springs satis- ie Delphic requirement of "a between waters". There is no ermanent river in all of Libia. was named for Cyrene, a nymph, said to have been to northern Africa by Apollo. came the mother of Aristaeus,



**Drawing of silphium plant from the book, *Zur Silphionfrage*, by Elsa Strantze.**

a demigod whose chief activity was the protection of men, domestic animals, and cultivated crops from the heat of the dog-days. Cyrene became a guardian spirit of the springs of water on which the life of the colony depended.

The fertility and richness of Cyrenaica in these early times were beyond compare, causing this part of the world to become "the granary of Rome and Greece". In 330 B.C., for instance, when most of the big cities of Greece were stricken by a great famine, Cyrenaica exported no less than 29,000 tons of wheat to them. Somewhat before this time, the rulers of Cyrene sent emissaries to Plato, the greatest philosophic thinker of the age, inviting him to examine and, if necessary, redraft Cyrene's entire legal code. This Plato politely declined to do on the ground that Cyrene was obviously too wealthy a city to pay any attention to what he would have to propose.

So rich was the area that the city of Bengasi was originally called Eu-esperides—an obvious allusion to the mystic garden of the Hesperides or daughters of Hesperus, the evening star. In this garden was supposed to grow the tree bearing the "golden apples" which Earth presented to Hera (Juno), supreme goddess of the heavens, on her marriage to Zeus (Jove). One of the "labors" of Hercules consisted in obtaining some of these apples. On an ancient coin of Cyrenaica, Hercules is shown receiving them from one of the Hesperides or, perhaps, from Cyrene herself. The choice of this name for the city lends further credence to the supposition that the Bengasi plain was then so immensely rich as to suggest the site of this fabulous garden. Some authorities have even thought that these "apples" were symbolic representations of the silphium plant depicted on the obverse side of the same coin.

Cyrene reached the height of its prosperity under its own kings in the fifth century B. C. Soon after 460 B. C., it became a republic. It passed over to Egyptian rule in 321 B.C., after the death of Alexander. About 300 B.C., Ptolemy I sent large numbers of Jews there as settlers and this element of the population increased rapidly. Several Cyrenian Jews are famous in history; among them are Jason of Cyrene, whose work is the source of the Second Book of Maccabees, and Simon of Cyrene who carried Jesus' cross from Jerusalem to Golgotha. At the time of Sulla (about 85 B.C.) the inhabitants of Cyrene were divided into four classes: citizens, farmers, resident aliens, and Jews.

A tentative key for the identification of the nests of some New Jersey land birds

X-QK 31
.M6

Harold N. Moldenke

This key is strictly tentative, based for the most part on the classification of A. R. Dugmore. Users must understand clearly that the position of a nest in this key is based on the general average or the usual and normal characteristics of the nest. Many nests show great variation, will be found in various habitats and positions, and will be composed of various materials depending on what is available at the locality. The key should be used only in conjunction with the nest descriptions given at the end, and special note should be taken of the other nests there listed which are often found in other parts of the classification.

1. Parasitic on other birds; no nest made; eggs laid in other occupied nests. Molothrus ater, eastern cowbird.
1a. Not parasitic; either making its own nest or using the old deserted nests of other birds or squirrels.
2. Nests usually saddled on top of branches.
3. Nest very small, about 3/4 inch inside diameter and 1/2 inch deep inside. Archilochus colubris, ruby-throated hummingbird.
3a. Nests larger.
4. Nests covered with lichens on the outside.
5. Nest with very thin floor and low sides, without downy lining. Myiochanes virens, eastern wood pewee.
5a. Nest cup-shaped, 1 1/2 inches deep inside, lined with plant down. Polioptila caerulea, blue-gray gnatcatcher.
4a. Nests not covered with lichens on the outside.
6. Nests usually containing or lined with much mud. Turdus migratorius, eastern robin [also called Planesticus migratorius].
6a. Nests without mud.
7. Nest rather shallow, including twigs, lined with grass and moss; eggs spotted. Nuttallornis mesoleucus, olive-sided flycatcher.
7a. Nest not shallow, without twigs, lined with feathers or other soft material; eggs unspotted. Empidonax minimus, least flycatcher.
2a. Nests not usually saddled on top of branches.
8. Nests mostly hanging from branches of trees or shrubs, the bottom unsupported.
9. Nest distinctly bag-like, 6--7 inches deep inside. Icterus galbula, Baltimore oriole.
9a. Nests merely basket-like or cup-like, about 2 inches deep inside.
10. Nest basket-like, made entirely of fresh grass, the upper edge laced to small branches and leaves. Icterus spurius, orchard oriole.
10a. Nests cup-like, made of old dried grasses, weeds, bark shreds, plant fibers, hair, paper, etc.
11. Nests with lichens on the outside.
12. Nests with spider webs woven on the outside, without wood chips, usually less than 2 inches deep inside.
13. Eggs white, with a few dark specks. Vireo olivaceus, red-eyed vireo.
13a. Eggs white, spotted and sometimes blotched with reddish-brown. Vireo gilvus, eastern warbling vireo.
13b. Eggs white with pink tinge, more thickly spotted. Vireo flavifrons, yellow-throated vireo.
13c. Eggs white, with the few dark spots often in a wreath-like cluster at the larger end. Vireo solitarius, blue-headed vireo.
12a. Nest with wood chips on the outside, 2 inches deep inside, 3 1/2 to 4 inches long outside. Vireo griseus, white-eyed vireo.
11a. Nest usually without lichens on the outside. Empidonax virescens, Acadian flycatcher.
8a. Nests not usually hanging from branches of trees or shrubs.
14. Nests normally covered above.
15. Nest gourd-, flask-, or retort-shaped, made with mud pellets, colonial. Petrochelidon albifrons, northern cliff swallow.

X-QK 31
.M6

Nature Study Notes -- Birds. III

Harold N. Moldenke,
Director, Trailside Museum

CROW. Man has aided the crow by clearing woods in the east and by planting scattered trees where they can nest on the great plains of our west. The crow has no serious natural enemies and raises four young a year, so a 3-fold increase in crow population is possible. This increase can continue until the population is as large as the food supply can maintain. As a result, any area that has been changed by man sufficiently to meet the crow's habitat requirements is soon populated to its crow-carrying capacity. The crow is omnivorous, eating small mammals, spiders, caterpillars, may-beetles, poultry, wild birds, miscellaneous beetles, carrion, corn, amphibians, crustaceans, and grasshoppers. The nestling crow will eat about 10 ounces of food per day, or about 13 1/8 pounds for its nestling life of 3 weeks. At the end of that time it will weigh about a pound and will have eaten, if combined, enough grasshoppers to make a grasshopper about twice its size. Wild birds and poultry would each form a mass about one-fifth that of the crow nestling, and corn about 1 1/2 times its mass. Crows eat huge amounts of destructive grubs. It is far more sensible to minimize or prevent crow damage to one's crops than to kill off every crow one sees. We need ALL our native birds, of which the crow is one, in order to maintain the balance of nature here.

In winter crows liven up the otherwise bleak landscape. At night they gather in huge rookeries of 5,000 to 200,000 individuals, in some huge trees, preferably evergreen, or even in marsh reeds. Crows begin to arrive at the rookeries in mid-afternoon but the real show begins about 3/4 of an hour before dark. Then they may pour in, 100 per second, 6,000 per minute, sometimes. The rookery may cover 10 acres of ground. They forage to 50 miles from the roost by day, but always fly back to it in the shortest possible line -- "straight as a crow flies" -- and so can easily be followed to the rookery. Those roosts may be used for 100 years or more.

Crows swallow everything whole. The indigestible parts are then compressed in the stomach into pellets 2 inches long and 1/2 inch wide. These are then disgorged and litter the ground under the roosts. By picking these pellets apart one can determine quite accurately the proportion of the crow's food. From October to February half the crow's diet is waste corn gleaned from the fields -- which fact is a contribution, not a detriment, to agriculture. Before the advent of man the crows used to eat acorns, poison ivy seeds, bayberries, and sumac seeds -- this this material is still the secondbiggest item of their diet in winter. Mouse bones, shells, and scales of dead fish are common in the pellets.

Crows will pull up germinating corn in the spring, but this can be prevented by coating the kernels with coal-tar before planting. The slight charge that crows make to the farmer in the fall by eating a small portion of the ripening corn is infinitesimal. The grubs they eat, which would otherwise kill the entire corn crop, make up many times for this slight toll.

One hundred thousand birds couls come from one pair of crows in ten years, but never do, because as soon as the carrying capacity of the area has been reached, the surplus starve or die from vitamin-deficiency or other diseases. The crow population remains the same from year to year in most areas. There is thus no need to dynamite rookeries, as some farmers do!

Crows winter south of where they breed, but they migrate only up to 1200 or 1500 miles at the most. Coal-tarring the seeds of corn is far more effective than the old-fashioned scarecrows that farmers used to erect in their fields.

A crow makes a nice pet. He is friendly andintelligent; can be taught to count to 5. Crows will set up 2 or 3 sentries when a flock is feeding. A tame crow may play catch with a twig instead of a ball and will hold it in its beak to urge you to try to get it away again. The crow has various calls, but the usual one is "caw-caw".

FISH CROW. The fish crow has a "ca-car" call, and is usually found close to water where he can get dead fish washed ashore.

RAVEN. This big bird is a great conversationalist. He is a scavenger at seacoast villages in the north. He is seldom found below 3000 feet elevations anywhere from Pennsylvania southwards. He will often soliloquize for hours at a time and can

X-QK 31
.M6
#5
WITH THE COMPLIMENTS OF
Harold N. Moldenke
JAN 2 1953

# PHYTOLOGIA

*Designed to expedite botanical publication*

5
Copy

Vol. 4 December, 1952 No. 2

CONTENTS

BOIVIN, B., *Pugillus Potentillarum* ..... 89

MONACHINO, J. V., *The South American species of Manilkara* ..... 94

MOLDENKE, H. N., *The known geographic distribution of the members of the Verbenaceae, Avicenniaceae, Stilbaceae, Symphoremaceae, and Eriocaulaceae. Supplement 9* ..... 119

MOLDENKE, H. N., *Notes on new and noteworthy plants. XIV* ..... 125

MOLDENKE, H. N., *The selected writings of a great naturalist* ..... 130

MOLDENKE, H. N., *Additional notes on the Eriocaulaceae. VIII* ..... 134

Published by Harold N. Moldenke and Alma L. Moldenke
15 Glenbrook Avenue
Yonkers 5, New York

Price of this number, 75 cents; per volume, $5 in advance
Vol. 4, No. 1, was issued March 17, 1952

X-QK 31
.M6 #76

# PHYTOLOGIA

*Designed to expedite botanical publication*

Vol. 4 August, 1953 No. 5

CONTENTS

LITTLE, E. L., JR., *Four varietal transfers of United States trees* ....305

MOLDENKE, H. N., *Additional notes on the Eriocaulaceae. XI* ....311

MONACHINO, J. V., *Miré, a new species of Brunfelsia from Bolivia* ....342

MOLDENKE, H. N., *Additional notes on the genus Aegiphila. XI* ....347

SMITH, L. B., *Notes on Bromeliaceae. II*....355

MOLDENKE, H. N., *A new species of Sphenodesme*....368

Published by Harold N. Moldenke and Alma L. Moldenke
15 Glenbrook Avenue
Yonkers 5, New York

Price of this number, 75 cents; per volume, $5 in advance
Vol. 4, No. 4, was issued June 8, 1953

X-QK 31
.M6



X-QK 31.M6#77

## ERIOCAULACEAE[21]

Eriocaulon atabapense Moldenke.

In moist sand among rocks 15 km. above San Fernando, Río Atabapo, Río Orinoco, *Maguire 29256*. The species is known only from this and three other collections: *Williams 13858, 14084* from the Río Atabapo, and a specimen without data in the Herbario Nacional de Venezuela which is probably a duplicate of one of the Williams collections. *A. C. Smith 2280*, cited as this species in Phytologia 3: 182 (1949), proves to be *E. tenuifolium*.

Eriocaulon humboldtii Kunth.

Occasional herb in wet border of Savanna III, 125 m. alt., Cerro Yapacana, Río Orinoco, *Maguire, Cowan, & Wurdack 30464*. The species ranges from Colombia (Méta) and Venezuela (Amazonas, Anzoategui, Bolívar, and Delta Amacuro) to British Guiana and Brazil (Amazonas and Mattogrosso).

Eriocaulon tenifolium Klotzsch.

With chalky-white heads, frequent in wet savanna northwest of the base of Cerro Moriche, 150 m. alt., Río Ventuari, *Maguire, Cowan, & Wurdack 30984*. The species is represented also by *Schomburgk 285* and *448* and *A. C. Smith 2280* from British Guiana. It has been reported from Bolívar, Venezuela, and from Amazonas and Bahia, Brazil, but perhaps erroneously.

Paepalanthus capillaceus var. proliferus Gleason.

Submerged aquatic perennial herb, with heads emergent white, becoming brown, abundant in the bed of Culebra Creek, 1200 m. alt., Cerro Duida, Río Cunucunuma, *Maguire, Cowan, & Wurdack 29611;* locally common in bed of Caño Culebra, 1300 m. alt., Cerro Duida, *Maguire & Maguire 29153*. Only some of the heads on these specimens have the proliferations described by Gleason; however all the heads show the characteristic pilosity not seen on any of the specimens of the typical form of the species thus far examined by me. The variety is known only from Cerro Duida *(Steyermark 58138)* and, in British Guiana, from Mount Roraima *(Tate 263, 552)* and the Kaieteur Plateau *(Maguire & Fanshawe 23243)*.

Paepalanthus fasciculatus (Rottb.) Körn.

Frequent on white sand, savanna in the vicinity of Base Camp, 150 m. alt., Cerro Sipapo (Paráque), *Maguire & Politi 28309*. A widely distributed and very variable species known from Colombia (Cundinamarca, Méta, Santader del Norte, and Vaupés), Venezuela (Amazonas and Bolívar), British Guiana, Surinam, French Guiana, and Brazil (Amazonas and Pará).

Paepalanthus kunhardtii Moldenke, sp. nov.

Herba parva caulescens; caulibus brevibus brachiatis; foliis rosulatis oblongo-ovatis erectis utrinque lucidis 2.5–4 cm. longis, 3–5 mm. latis, ad basim longe villosis subcoriaceis; vaginis laxiusculis 4–5 cm. longis multistriatis glabris, lamina 5–6 mm. longa erecta longe ciliata; pedunculis graciliusculis brunneis 19–23 cm. longis tricostatis dense laxeque pilosis; capitulis hemisphericis atro-griseis 5–8 mm. diametro.

Small caulescent herb; stems 1.5–3 cm. long, often short-branched, densely long-villous; leaves rosulate, those at the tip of the main stem and of the branches forming what appears to be one many-leaved rosette, oblong-ovate, bright green and shiny on both surfaces, erect, 2.5–4 cm. long, 3–5 mm. wide at the mid-point, ampliate-clasping at the base, glabrous on both surfaces except for the long-villous base, acute or subacute at the apex, thick-textured or subcoriaceous;

[21] By H. N. Moldenke.

QK 31
.M6

X-QK 31.M6 #78

# NATURE STUDY NOTES

## Inventions in Nature - I

Harold N. Moldenke,
Director, Trailside Museum

These notes are intended to accompany my illustrated lecture on this subject.

We human beings are very egotistical and vain. So often we take the credit when credit is not due us. Let's consider for a while this matter of "inventions" --

SHOW WINDOWS -- Have you ever gone shopping with your mother or father? Have you ever done "window shopping"? I'm sure you have. We all have. We walk down Main Street and we see the beautiful store windows. We stop and look at the lovely things displayed in them. And usually we are so attracted by the displays that we go in and buy something. This makes the storekeeper happy. His window display advertising has been successful. If it is successful long enough he will be a successful storekeeper. Many large stores hire men and women to decorate their show windows for them, because these people know just how to display things to attract the attention of the passersby. Such advertising experts receive big salaries. And if a store remains in business for 25 years, there is usually a celebration, with flags and banners and bunting; if a store stays in business for 50 years, we have a bigger celebration; if it stays in business for 100 years the whole town celebrates! -- BUT the wild flowers in our fields and woodlands have been using show windows -- and decorating them effectively, too -- not for 26 or 50 or 100 years, but for <u>millions and millions of years</u>! They invented show window advertising, not we! We are just copying them them. -- Here the Blue Lobelia (<u>Lobelia siphilitica</u>) shows us its show windows, all decked out in blue. And why blue? Because blue is the favorite color of the bees. Plants that are making a bid for the trade of honeybees decorate their show windows in blue, so that bees will be attracted, will stop and shop, and in so doing will pollinate the flowers. -- And here in the Cardinalflower (<u>L. cardinalis</u>) we see the show windows decorated in brilliant red. This is the favorite color of hummingbirds, and these flowers are constructed in such a way by Mother Nature that hummingbirds can best pollinate them. So to attract those birds the flowers are red.

BARBED-WIRE ENTANGLEMENTS -- When our soldier boys want to protect their front line trenches or dugouts or the boundaries of their camps they often erect masses of barbed-wire. This prevent the enemy from sneaking up on them. -- But our soldiers did not invent that idea. The Poor-robins-plantain (<u>Erigeron pulchellus</u>) used barbed-wire entanglements to discourage its enemies millions of years ago, and found it so successful that it is using it still in our meadows and fields! The stems and branches of this plant are very densely hairy with long bristly hairs. The flowers face upwards, where they will be most visible to the flying hairy-bodied insects like bees and butterflies, whose hairy bodies are well adapted to carrying the plant's pollen from flower to flower. But there are other insects here -- smooth-bodied ones -- the ants and beetles. They approach the plant from below, from the ground. They would rob the flowers of their nectar without giving any pollinating service in exchange. So the plant puts up barbed-wire entanglements up and down its stems and branches -- to discourage these pilferers!

AVIATION -- Man thinks he is very smart, now that after so many centuries of trying, he finally is able to fly through the air. But most insects and birds have done this for millions of years. And the Canada Goose (<u>Branta canadensis</u>) even knows about flying in V-formation. When your rowboat or canoe travels through the water of a lake or stream it leaves a V-shaped wake in the water behind, does it not? Similarly, when a bird flies through the air it produces a V-shaped wake in the air. It is said to be easier for birds to fly on the arms of this V; so, the biggest, strongest male Canada Goose takes the lead. With his strength he bucks and breaks the air. Then the younger weaker males, the females, and the aged or sickly take up their positions on the arms of the V, where flying is easier.

(-QK 31
.M6

# Nature Study Notes -- Butterflies. I

Herold N. Moldenke,
Director, Trailside Museum

These notes are intended to accompany my illustrated lecture on "Butterflies".

The Order Lepidoptera is usually divided into three parts: (1) butterflies, (2) skippers, and (3) moths. All these creatures are six-legged, jointed-legged invertebrates with four membranous wings more or less covered with scales. Their mouthparts are usually adapted for sucking in the adult stage. The metamorphosis is complete and indirect, that is, from egg to larva (called caterpillar) to pupa (the resting stage) to imago (adult). They are noted for the brilliant colors of many of the species.

In butterflies the antennae end in knobs; in skippers they end in a recurved knob and hook; in moths they are not knobbed, but are either straight or feathery.

All Lepidoptera breathe by means of spiracles along the sides of the body and the air is then conducted throughout the body by tracheae (not by the bloodstream as in the case of vertebrates). The oxygen of the air is needed by the individual cells in their physiology, and that is why air must be brought to the cells either by the blood (as in vertebrates) or by the tracheae (as in insects). The blood in insects carries other food matter to the cells and removes the soluble wastes.

The proboscis may be 5 or 6 inches long in some species of sphinx moth. It is coiled up under the head when not in use.

There are over 7,000 species of Lepidoptera in the United States, of which 900 are butterflies. The Lepidoptera are divided scientifically into two suborders:

1. Rhopalocera -- these are diurnal (butterflies and skippers)
2. Heterocera -- these are nocturnal (moths)

Skippers fly in fast jerky spurts from plant to plant, near ground level, looking like wounded butterflies. Many true butterflies also fly in very jerky irregular courses, but not in spurts like the skippers. Such flight renders them more difficult to pursue and catch

Butterflies usually perch with their wings closed against each other in a vertical position. Moths usually perch with the wings outspread. Butterflies (originally "flutter-byes") usually are short-lived. Many live only a few weeks, or a few days -- or even only a single day -- in the adult stage. Moths usually live longer in the adult stage. Most Lepidoptera have their entire life span from egg to dying adult confined to a single twelve-months period. Butterflies spend the pupal stage as naked chrysalids -- moths, on the other hand, spin cocoons inside of which they pupate. In a very few cases here in the north temperate zone adult butterflies may overwinter (like the Mourning Cloak and Red Admiral) or may migrate south in huge flocks (like the Monarch). In most cases the winter is spent in the egg or pupal stage. Very seldom do the larvae overwinter (like in the Great Spangled Fritillary) out-of-doors; indoors the Clothes Moth often overwinters in the larval stage

Reproduction takes place in the adult (imago) stage, and fertilization is internal [as in reptiles, birds, mammals, etc., not external as in amphibians and fish]. Solid food cannot be eaten in the adult stage. Most Lepidoptera in the adult stage have only a proboscis for sucking up nectar and water. They live their adult life largely on the food stored up in the body while in the larval (caterpillar) stage. Some moths have no stomachs at all, and take in no food whatever in the adult stage.

Morpho ephiclus and Lycaena comyntas. Here we see a large and a small butterfly species. The first measures five inches across, and the other only 3/4 of an inch. The largest known butterfly (Douria sp.), living in western Africa, measures seven or more inches across, although the Owl's Head Butterfly has a larger wing area.

Butterflies have been on this earth about fifty million years. The pollinate some long-tubed slender-tubed flowers like thistles, but in general are not very valuable as pollinators. Their chief enemies are birds which would eat them, and wasp-like insects that would parasitize their eggs and larvae. Their chief methods of defense are (1) swift flight, (2) zigzag or jerky flight, (3) protective coloration of camouflage patterns, (4) disagreeable taste, and (5) imitation of species that do have a disagreeable taste. In the larval stage many are armed with bristles, will roll into hedgehog-like balls, bear stinging hairs, imitate buds or twigs, or have

QK 31
M6

# Nature Study Notes. Arachnids - I

Harold N. Moldenke,
Director, Trailside Museum

These notes are to accompany my illustrated lecture on "Spiders"

Spiders are invertebrate animals with jointed legs, like the insects, with which they are often confused by the layman. They can be distinguished from insects at once by the fact that they have four pairs of legs (8 legs in all) while insects have only three pairs (6 legs in all). Also, insects have three sections to their body (head, thorax, and abdomen), while in spiders the head and thorax are united into one piece (called the cephalothorax). They have no antennae.

Spiders belong to a class of animals called the Arachnida or "arachnids". There are 13 orders in this class, as follows:

1. Araneida -- spiders
2. Scorpionidea -- scorpions
3. Phalangidea -- harvestmen or daddy-longlegs
4. Acarina -- mites and ticks
5. Podipalpi -- a nocturnal group of tropical animals
6. Palpigradi -- very tiny (1 mm. long) creatures
7. Solifugae -- hairy spider-like creatures living in warm countries
8. Chernotifie -- small creatures that cling to large insects and are carried about by them
9. Xiphosura -- king-crabs
10. Eurypterida -- fossils in Silurian and Devonian seas
11. Pycnogonida -- parasitic on seaweeds (algae) and on coelenterates
12. Tardigrada -- bear-animalculae, minute creatures on tree trunks and debris
13. Pentastomida -- parasites in the noses of carnivores

Of all these the spiders are best known to most people. Probably 500 kinds of spiders live around any city in the United States.

The HUNTING SPIDERS do not build webs. They have a nest, but leave it and travel about looking for prey, or lie in wait somewhere for prey to come to them. Our CRAB SPIDERS are among this group. They often lie in or on flowers and wait there for insects to visit the flowers, whereupon they catch them. Often the spider is of the same color as the flower on which it rests, and is thus protected from potential enemies like birds. A yellow crab spider is common here on goldenrod heads. These spiders often get from stalk to stalk by throwing a silken rope across to the other support and then walking over on it, like we shoot a breeches-buoy to a ship in distress.

The WEB SPIDERS build webs for catching their prey. They live either in the web or in a nest close to it. There are four main types of webs:

1. Cobweb type. Here the flat web is closely woven out of long threads, crossed by finer threads running in all directions, connected with a tunnel-like tubular nest in which the spider hides. There are strands, like a fisherman's line, which run from all parts of the web and end in the tunnel. The spider rests in the tunnel with its legs on these lines. An insect falling into any part of the web will, in its struggles, pull on one or more of these lines. The tug on the line will be communicated to the waiting spider, who then runs out to the proper sector of the nest to capture its prey.

2. Fishnet type. Here the webs are net-like, made of smooth threads in large meshes, sometimes with the shape of a flat or curved sheet, held firm by threads running in all directions to supports. The spider lives on the underside, back downwards.

3. Orb type. Here there are rounded or orb-like webs composed of spokes radiating from a common center, usually smooth. These are crossed by circular loops and spirals, mostly adhesive. The spider usually lives in the center. Sometimes she secretes the web on the approach of danger, as the Golden Garden Spider of our area does.

4. Loose band type. The webs of certain species are composed in part of loose bands of silk.

Spiders have spinning organs, called spinnerets -- 3 pairs near the back end of

X-QK31.M6 #30

X-QK 31
.M6

Report of the Director, Trailside Museum, Watchung Reservation, to the Trailside Museum Committee, January 15, 1953

As you know, I was appointed Supervisor of Nature Activities for the Union County Park Commission and Director of the Trailside Museum on September 1, 1951, but served only on a part-time basis until March 31, 1952. On April 1, 1952, I took over on full-time basis. Following is a report on some of my chief activities during this period.

(1) Lectures, talks, and reports delivered, introductions made, and field trips conducted:

September 17, 1951 -- Local plants and animals -- New Jersey State Teachers College class, Weirinnee Park -- 18 present

September 24, 1951 -- Local plants and animals -- New Jersey State Teachers College class, Trailside -- 18 present

October 1, 1951 -- Local plants and animals -- New Jersey State Teachers College class, Trailside -- 18 present

October 1, 1951 -- Systematic botany -- New York Botanical Garden School for Gardeners class, New York -- 26 present

October 2, 1951 -- Local plants and animals -- Blue Star Garden Club and Girl Scout leaders class, Trailside -- 30

October 8, 1951 -- Local plants and animals -- New Jersey State Teachers College class, Trailside, and Brownie pack -- 27 present

October 8, 1951 -- Nomenclature of plants -- New York Botanical Garden School for Gardeners class, New York -- 25 present

October 9, 1951 -- Local plants and animals -- Blue Star Garden Club and Girl Scout Leaders class, Trailside -- 21 present

October 12, 1951 -- Marvels in adaptation among our local plants -- Garden Center of Elizabeth -- 30 present

October 14, 1951 -- Local plants -- John Burroughs Memorial Association field trip to Slabsides, West Park, N. Y. -- 35 present

October 15, 1951 -- Local plants and animals -- New Jersey State Teachers College class, Trailside -- 18 present

October 15, 1951 -- Naming of plants -- New York Botanical Garden School for Gardeners class, New York -- 20 present

October 18, 1951 -- Plants of the Bible -- Millbrook Garden Club, Salisbury, Conn. -- 55 present

October 22, 1951 -- Local plants and animals -- New Jersey State Teachers College class, Trailside -- 18 present

October 22, 1951 -- Plant nomenclature -- New York Botanical Garden School for Gardeners class, New York -- 20 present

October 23, 1951 -- The land of manana -- Married Couples Club, Park Methodist Church, Bloomfield -- 40 present

October 24, 1951 -- Trailside Museum program -- Rotary Information of Elizabeth -- 60 present

October 29, 1951 -- Local plants and animals -- New Jersey State Teachers College class, Trailside -- 18 present

October 29, 1951 -- Scientific plant names -- New York Botanical Garden School for Gardeners class, New York -- 25 present

November 2, 1951 -- Plants of the Bible -- Married Couples Club, Village Church, Bronxville -- 35 present

November 5, 1951 -- Local wild flowers -- New Jersey State Teachers College class, Trailside -- 18 present

November 5, 1951 -- Meaning of scientific names -- New York Botanical Garden School for Gardeners class, New York -- 25 present

November 9, 1951 -- Plants of the Bible -- Kings County Association of Garden Clubs, Brooklyn -- 125 present

November 12, 1951 -- Nature study for children -- New Jersey State Teachers College class, Weirinnee Park -- 18 present

November 12, 1951 -- Meaning of scientific names -- New York Botanical Garden School for Gardeners class, New York -- 25 present

X-QK31.M6 T51

X-QK 31
.M6

# FINAL EXAMINATION - FIRST TERM - NATURE STUDY

Harold N. Moldenke

Answer any twenty (20) of the following questions:

1. Describe some of the inter-relationships between birds and seed-plants.
2. What is the value of fallen leaves and other fallen vegetation on the ground?
3. What place in the balance of Nature do our birds of prey hold?
4. Give five reasons for teaching Nature Study to children.
5. How would you interest kindergarten children in Nature Study? Third graders? Seventh graders? High School seniors?
6. What would you try to show small children on a Nature Walk?
7. What could you have in a Nature Corner in your classrooms in kindergartens? primary grades? secondary schools?
8. Suggest several Nature Study projects for children.
9. Describe six Nature Study games for primary children. Six for secondary school children and scouts.
10. What is meant by these terms: galls, exfoliating bark, flaucous, chambered pith, decussate leaves, species, genus, parthenogenesis, polyembryony.
11. Name four different kinds of sumac and tell how to differentiate them.
12. Name several different kinds of goldenrod and tell how to differentiate them.
13. What is the truth about goldenrods and hay-fever?
14. What are crab spiders? where do they live? how are they protected? how do they capture their prey? how do they sometimes get to another stalk?
15. What can you tell about the courting habits of spiders?
16. What are the four wild animals in Union County that are most dangerous to human beings and must be watched out for on trips?
17. What feature on the leaves of cherry, plum, and peach trees makes them easy to identify?
18. What interesting thinks can you tell of the Bald Eagle and his habits?
19. What interesting things can you tell about the grebes?
20. What would you tell your children about shrikes? woodpeckers?
21. Tell some interesting things about the Great Blue Heron, the Nighthawk, the Chimney Swift, the Flicker, the Hornbill, the Kiwi.
22. What is the largest bird in the world? the largest plant? the largest animal? the heaviest animal? the heaviest living organism?
23. What are precocial birds and altricial birds? Give examples.
24. Why do woodpeckers drum?
25. What bird makes parallel circles of tiny holes in apple-tree trunks?
26. Define the terms hibernation, aestivation, andmigration. Give examples.
27. What birds make the largest migrations? What other groups of animals migrate? Give examples.
28. Describe the nest of th Goldfinch. With what plants are these birds associated?
29. What bird is first to start nesting in New Jersey? what one is last?
30. Name the state flower, bird, and tree.
31. Give some of the main differences between insects and spiders.
32. Name three primates, three cetaceans, three rodents, three ungulates
33. Name six common winter birds of New Jersey.
34. Draw diagram of a simple flower and name all the parts.
35. Describe some of the ways in which plants are disseminated.
36. List some ways in which we can all help save our wild life.
37. Why is it important to conserve our wild life?

X-QK 31.M6 #82

X-QK 31
.M6

# Nature Study Notes. Birds I
(edition two)

Harold N. Moldenke
Director, Trailside Museum

Birds are warm-blooded vertebrate animals, breathing by means of lungs, and with their body more or less covered with feathers (not scales nor hair). The sense of sight is dominant over all other senses. There are about 28,000 kinds of birds in the world today, arranged in 2600 genera. In the United States we have about 1500 kinds, classified into 768 species and 800 varieties or "subspecies". Of these about 100 are mere accidentals -- visiting our territory only very rarely when blown over by storms or by straying out of their normal range. The chief orders of birds are as follows, with the highest evolved on top:

1. Passeres, the perching or sparrow-like birds. Included are thrushes, bluebirds, warblers, kinglets, gnatcatchers, titmice, nuthatches, chickadees, creepers, wrens, thrashers, mockingbirds, catbirds, wagtails, pipits, vireos, shrikes, waxwings, chats, swallows, tanagers, finches, sparrows, blackbirds, orioles, starlings, ox-peckers, crows, jays, magpies, larks, flycatchers
2. Trogones, the trogons and colies
3. Macrochires, the swift-like birds. Included are the goatsuckers, swifts, hummingbirds, nighthawks, whippoorwills, frogmouths, oilbirds
4. Pici, the woodpecker-like birds. Included are the woodpeckers, wrynecks, puffbirds, jacamars, barbets, honeyguides, toucans
5. Coccyges, the cuckoo-like birds. Included are the cuckoos, anis, kingfishers, plantain-eaters, hornbills, hoopoes, rollers, motmots, todies
6. Psittaci, the parrot-like birds. Included are the parrots, macaws, parakeets, parequets, cockatoos, nestors, lories
7. Rapteres, the birds-of-prey. Included are vultures, hawks, eagles, kites, falcons, caracaras, ospreys, owls, harriers, secretary-birds
8. Columbae, the dove-like birds. Included are the pigeons, doves, dodo, solitaire
9. Gallinae, the gallinaceous or fowl-like birds. Included are the quail, grouse, turkeys, guinea-fowl, peafowl, mound-builders, curassows, bustard-quails, hemipodes, Madagascar kagu
10. Limicolae, the shore birds. Included are phalaropes, stilts, avocets, snipes, sandpipers, plovers, surfbirds, turnstones, oyster-catchers, curlews, sheath bills, jacanas, killdeers, yellow-legs
11. Paludicolae, the marsh birds. Included are cranes, courlans, rails, gallinules, coots, bustards
12. Herodiones, the long-legged waders. Included are spoonbills, ibises, storks, herons, bitterns, shoebills, umbrella, egrets
13. Odontoglossae, the flamingoes
14. Anseres, the water fowl. Included are ducks, geese, swans, screamers
15. Steganopodes, the totipalmate swimmers. Included are the tropicbirds, gannets, boobies, darters, cormorants, pelicans, manowar-birds, snakebirds
16. Tubinares, the tube-nosed swimmers. Included are albatrosses, fulmars, petrels, shearwaters
17. Longipennes, the long-winged swimmers. Included are jaegers, skuas, gulls, terns, skimmers
18. Pygopodes, the diving birds. Included are grebes, loons, auks, murres, puffins
19. Sphenisciformes, the penguins and rockhoppers
20. Apteryx
21. Elephant-birds
22. Moas
23. Tinamous
24. Cassowaries and emeus
25. Rheas
26. Ostriches
27. Ichthyornis
28. Hesperornis
29. Archaeopteryx, the lizard-tailed birds

X-QK 31
.M6

# NATURE STUDY NOTES. AMPHIBIANS I

Harold N. Moldenke,
Director, Trailside Museum

To accompany my illustrated lecture on "Amphibians".

Amphibians are cold-blooded vertebrate animals breathing by means of gills in early life, but some of which may become air-breathers by means of lungs in adult life. There are about 2,000 species in three orders. These orders are (1) Salientia, the frogs and toads, (2) Caudata, the salamanders, mud-puppies, hellbenders, congo-eels, and sirens, and (3) Apoda, the coecilians or legless wormlike amphibians found in tropical and subtropical regions.

Most amphibians leave the water when they lose their gills, but the Mud-puppy (Necturus maculosus) has gills all through life and also remains in the water all through life. Mud-puppies feed on crayfish, insect larvae, fish, snails, leeches, fish eggs, and aquatic plants.

SALAMANDERS are often confused with lizards, but lizards are reptiles, breathing by means of lungs all through life, with their body covered by scales, dry to touch, inhabiting hot dry places. Salamanders are amphibians, breathe by means of lungs only when adult, have naked bodies that are moist and cold to touch, and inhabit moist or wet places. Salamanders are tailed all through life. The largest known salamander is the Giant Salamander (Megalobatrachus maximus) of Japan. Land salamanders and newts are usually much smaller, ours are only 2 1/2 to 8 inches long. They are found in their adult form mostly under rocks near streams, although the newt and a few others may spend most of its adult life in the water, too. Salamanders eat insect larvae, small crustaceans, worms, maggots, small mollusks, and other small animal life found in and among decaying vegetation and moss. Their eggs are laid in April, May, or June. In some cases a nest is made for the eggs. The NEWT (Diemyctylus viridescens) makes an individual nest for each egg. This nest is made out of aquatic vegetation. In some cases where adult salamanders remain in the water most or all the time they retain their gills.

The Mud-eel (Siren lacertina) is an amphibian of the siren group, having only its front pair of legs developed.

Salamanders are said to be most abundant on the Appalachian Highlands. The gilled immature form of the Tiger Salamander (Ambystoma tigrinum) is called the "axolotl". The gills persist even in the adults here when they remain in the water and for a long time it was not realized that this creature is the same as the gill-less land-dwelling Tiger Salamander.

The female Dusky Salamander (Desmognathus fuscus) winds strings of her eggs about her body and hides in a secluded spot, incubating them until hatched. The Slimy Salamander (Plethodon glutinosus) gives off a large quantity of slime when annoyed or irritated.

In most amphibians the eggs are fertilized externally, but in the Apoda and in some of the Caudata they are fertilized internally. The Fire Salamander (Salamandra maculosa) is ovo-viviparous, that is, the young are born alive but there is no placental connection between the young and the mother as in truly viviparous animals like mammals. The eggs of all salamanders are gelatinous-covered and are laid in water. In contrast, the eggs of reptiles are all leathery-covered, are all fertilized internally, and are all laid on land.

FROGS and TOADS are more numerous than salamanders. We have 56 species in North America. The toads and tree-frogs spend most of their adult lives on land, but many aquatic frogs spend much of their adult life in water. All, of course, spend most of their larval or immature stage in water. The land-living forms have only slightly webbed hind feet or else no webs between the toes at all. They crawl or hop, burrow into the ground, or climb trees. They need dark moist hiding places in the daytime, they usually breed only in water.

Frogs are herbivorous when young, but carnivorous when adult. Their eggs, like those of all amphibians, are gelatinous-covered. They are usually laid in the spring in large masses in water. The larvae are called "tadpoles" or "pollywogs" and usually mature into adults in the summer of the same year, but in the bullfrog (Rana catesbiana) it takes two or even three years for them to mature. The tadpoles of all frogs

X-QK 31
.M6

# Nature Study Notes. Cetaceans I
(edition 2)

Harold N. Moldenke,
Director, Trailside Museum

X-QK 31.M6 #85

Cetaceans are all aquatic mammals, mostly marine. Their hind limbs are vestigial. Their teeth are homodont (that is, are all alike). The front limbs are modified into fins and are used in steering. The tail has broad horizontal fins, called "flukes", which propel the body through the water. The entire body is exquisitely streamlined for rapid swimming. The skin of the body is not covered by hair, but there are usually a very few scattered hairs. The natural heat of the body is conserved, in the absence of a fur coating, by means of a very thick layer of fat, called "blubber", just beneath the skin.

Cetaceans are found in all oceans and seas, and a few ascend larger rivers to above tidewater influence. Mostly they are social, and travel about in schools. They like to food and play together. Some species migrate with the seasons from ocean to ocean, probably following their food supply. Others, which feed on organisms which are limited to one area or are restricted by climatic conditions, do not migrate. About 37 species of cetaceans are known. They usually get one baby at a time.

WHALES comprise the largest group of cetaceans. Because they have been hunted so mercilessly by man, most of them are almost extinct by now. All whale, porpoises, and dolphins — that is, all cetaceans -- are strictly carnivorous, feeding on fish, octopods, squid, crustaceans, or plankton. Whales are thought to be strictly monogamous. Their nostrils are lunate (half-moon shaped), borne on the top of the head. Before diving a whale will surface and fill his lungs with cold air. Then he dives and can stay under water 15 to 20 minutes. The air in his lungs becomes heated to the temperature of his body (whales are mammals and therefore are warm-blooded) and becomes saturated with body moisture. Then the whale surfaces again and expells the air from his lungs through his nostril. The air, now heated to approximately 98° F., strikes the icy air of the atmosphere above the ocean and its moisture is at once condensed into steam, like the air expelled from a tea-kettle. The "spout" one sees, therefore, from a surfaced whale is merely the air he has expelled and the moisture it contained condensed into steam. It is not a spout of water as most people think. Whalers can identify a whale by the size and other characteristics of its spout.

"Ambergris" is a solid, opaque, ashy-colored, inflammable substance often found floating on the sea where whales abound, or washed ashore. It may be found in masses weighing 60 to 225 pounds. It is very fragrant when burned and is highly valued in perfumery. Zoologists think that it is produced in the intestines of whales whose innards have been injured by the indigestible beaks of cuttlefish on which they have been feeding. It is supposed that the ambergris is secreted to enclose the beak and thus enable it to be evacuated by the whale.

One of the best whaling areas known is off the New Jersey coast. There are three traprock ridges under the surface of the sea there, roughly paralleling the Watchung Mountains on land. Their tops are only a few fathoms below the surface of the sea. Whales breed along the outermost of these ridges which runs along the edge of the continental shelf. Sometimes they get over between this outermost and the inner ridges and wear themselves out trying to find their way back to sea. They are then often beached on the New Jersey shore.

Bom hed whales die quickly -- of suffocation. Their huge bodies, not buoyed up by water, quickly crush their lungs by their sheer weight, making breathing impossible. There are two general groups of whales:

(A) TOOTHED WHALES, having their jaws lined with huge teeth. These are among the most dreaded killers of the seas. They have large throats for swallowing their prey. Among them are:

(1) SPERM WHALE (Physeter macrocephalus). This is a toothed whale, often called the "cachalot". It is the King of the High Seas. It is normally peaceful until aroused, whereupon he will turn upon his tormentors (the whalers) and crush their boats like matchwood. An enraged charhing bull of this species may hopelessly wreck even a big whaling ship. His blunt nose is backed by 60 feet of flesh and bone, making a terrific battering-ram. His enormous jaw, with 20 to 30

X-QK 31. Mu #36
In Oversize Box 79

# Plants in the Life of Christ

by Harold N. Moldenke, Yonkers, New York, Author of *Plants of the Bible*

AT CHRISTMAS time our thoughts naturally gravitate to the Child of Bethlehem, and, if we are botanically or horticulturally inclined, it is inevitable that we should think also at this time of the flowers and plants associated with His life and with the lives of those most intimately associated with Him during His ministry on earth. From this starting-point, our thoughts will probably travel on to the many kinds of plants used in the celebration of Christmas in various lands throughout the ages.

That Jesus knew and loved plants and flowers we know from the many times that He spoke of them in His sermons, and this was only natural, for He lived mostly in the open country among plain and ordinary peasant people — tillers of the soil — in whose daily lives the plants of the region played a large and important part.

In His sermons He spoke of the "lilies of the field," now regarded as having been *Anemone coronaria;* the "mustard," *Brassica nigra;* the "husks," *Ceratonia siliqua* and the fig, *Ficus carica.* He spoke of the "vine," *Vitis vinifera;* "thistles," *Silybum marianum* and "bramble bushes," *Rubus sanctus.* The "manna" to which He once referred is believed to have been *Lecanora esculenta* and related species of lichens. The "hedge" of which He speaks was made, in all probability, of *Rhamnus palaestina,* and the "reed" to which He compared John the Baptist was *Arundo donax.* The oil of which He spoke was made from olives, *Olea europaea.* His "thorns" were in some cases *Zizyphus spina-christi,* in other cases *Centaurea calcitrapa* and *C. iberica.* In His censuring of the Pharisees, He spoke of mint, *Mentha longifolia,* anise, *Anethum graveolens,* cummin, *Cuminum cyminum,* and rue, *Ruta graveolens.* Several times He spoke of the grass that clothes the fields. The "tares" of His famous parable were darnel-grass, *Lolium temulentum,* and His "sycamine" tree was *Morus nigra.*

On the occasion of Jesus' triumphant entry into Jerusalem the crowds about Him carried and waved palm leaves. These were from the date, *Phoenix dactylifera.* The barley loaves which figured in one of His miracles were made from *Hordeum distichon* and several related species. The "corn field" through which He passed with His disciples one Sabbath day was a field of wheat, *Triticum aestivum,* and the "sycomore" which Zacchaeus climbed in order to see Him was *Ficus sycomorus.* The "spikenard" with which Mary Magdalene anointed His feet was *Nardostachys jatamansi* from the Himalayas.

This famous engraving by Martin Schongauer, taken from *Plants of the Bible,* depicts the flight of Joseph and Mary and the infant Jesus into Egypt to escape the soldiers of Herod. A date palm, *Phoenix dactylifera,* bent down its head as they passed to permit them to feast on its fruits. The other plants shown are *Dracaena ombet,* not a Bible plant, and Our Lady's thistle, *Silybum marianum,* near the donkey's head.

As His life drew to its ineffably tragic close, a crown of thorns was made from the pliable stems of *Paliurus spina-christi* and forced down over His brow, a mock sceptre of *Typha angustata* — if we may believe Rubens and other early Italian painters — was placed in His hands, and the juice of "gall," *Citrullus colocynthis,* was placed on a long stem of dhura, *Sorghum vulgare* var. *durra,* and given Him to drink. After His death, His body was embalmed with myrrh, *Commiphora myrrha,* and aloes, *Aloe succotrina,* and then wrapped in shrouds of linen, made from *Linum usitatissimum.* In Poland the sceptre in Jesus' hand during His trial is usually represented as having been the leek, *Allium porrum.*

Myrrh was brought to the infant Jesus by the Wise Men, and with it they offered Him frankincense, *Boswellia thurifera.*

In many legends and traditions following, various plants are mentioned which never grew in Palestine in Jesus' time. They are, therefore, not Bible plants. This does not, however, detract from the beauty of the symbolism and stories nor from popular interest in them.

A lovely old legend tells us that a young shepherdess saw the Wise Men on their way with their precious gifts. Not having anything herself to offer, she wept bitterly. An angel appeared and waved his hand over her. Immediately where her tear drops had fallen there appeared lovely white Christmas-roses, *Helleborus niger,* each with a glowing central crown of golden stamens. She picked these joyfully and brought them to the infant child, who, seeing them, smiled and touched them with His tiny fingers. As He touched them, their pristine whiteness became tinged with purplish-pink, as we see in the flowers today.

Another legend tells us that the straw on which Mary lay, when she gave birth to Jesus, was made of the dried stems of *Galium verum,* whose tiny yellow flowers simulate the golden star that heralded His birth. Hence this plant has for centuries been known as "Our Lady's bedstraw," and has been widely used in England and elsewhere in Christmas celebrations.

In France a legend says that the straw on which Jesus lay in the manger was esparcet or cockshead, *Onobrychis viciafolia,* widely cultivated in Europe as a forage plant. On His birth, it suddenly opened all its flowers and formed a pale-pink wreath about His head. For this reason the plant is now called "sainfoin" or "saintfoin," that is, "holy hay" in that country and "holy

X-QK 31
.M6

*The true lilies of the field, mentioned in the Bible, are the brightly-colored flowers of* Anemone coronaria.

*Photos: Genereux*

# Plants of the Easter Tradition

by Harold N. Moldenke, Yonkers, New York

VERY many legends deal with Jesus' mock trial and crucifixion. Among the plants supposed to have furnished the crown of thorns are the boxthorn, *Lycium europaeum*, wild hyssop, *Capparis spinosa*, whitethorn, *Crataegus oxyacantha*, bramble, *Rubus fruticosus*, buckthorn, *Rhamnus cathartica*, barberry, *Berberis vulgaris* and the Madagascar *Euphorbia mili*. An ancient tradition states that drops of blood fell from beneath the rose-brier crown, *Rubus coronarius*, later to spring up from the ground as true red rose blossoms. In Germany a legend says that the holly, *Ilex aquifolium*, was used, and its red berries (white before the crucifixion) symbolize the drops of blood produced by the thorns. In parts of the Orient the "prickly-rush" or butchers-broom, *Ruscus aculeatus*, is the plant accused, while in the West Indies it is believed that a branch of cashew, *Anacardium occidentale*, was used. As a result one of the originally bright golden petals of each tiny flower is now black or blood-stained.

In Cheshire the spotted leaves of *Orchis maculata* — there called "Gethsemane" — are believed to have derived their spots from the drops of bloody sweat that fell from Jesus' brow during His agony in the Garden of Gethsemane. In other regions the leaves of purpleleaf wood-sorrel, *Oxalis corniculata atropurpurea*, and ladys-thumb, *Polygonum* and *Tovara*, the spathes of *Arum maculatum* and the flowers of the red forms of *Anemone coronaria* owe their red color to drops of His blood that fell from the cross.

Legends tell us that the cross on which Jesus was crucified was made of juniper, *Juniperus communis* — the same tree, in fact, which had hidden Him on the flight to Egypt. Another says it was our eastern flowering-dogwood, *Cornus florida*, which has been low and crooked of stature and small of stem-diameter ever since, with the bloody marks of the nails in its four floral bracts. A very ancient legend states that the upright beam of the cross was made of cedar, *Cedrus libani*, the cross-arm of cypress, *Cupressus sempervirens*, and the title of olive.

*The parts of the passion flower were first associated with the Crucifixion in the 17th century.*

The single tree which is said to have furnished these woods is the selfsame one which grew from a slip (or from three seeds, according to other versions) given to Seth by the angel guarding the Garden of Eden when Seth came to him for a piece of the Tree of Life for his dying father, Adam. This slip, planted in Adam's mouth, grew into a three-trunked tree — one trunk being of cedar, one of cypress and one of olive. Beneath this tree David wept in contemplation of his sins. Solomon eventually felled it, but its wood was too hard to be hewn, so it was cast aside into a marsh. The Queen of Sheba, while visiting King Solomon, was asked to walk across it as over a bridge. This she refused to do, saying that she would not tread on the tree that someday would be fashioned into a cross and bear the body of Christ.

Another legend tells of an angel who took refuge under a massive cedar during a great storm. After the tempest had abated he prayed to God that this magnificent tree, whose wood was so fragrant and whose shade was so refreshing and protecting, might someday also bear a fruit of benefit to the human race. This fruit was the sacred body of Jesus.

An early Christian legend in Poland holds that the cross was fashioned of aspen wood, *Populus tremula*, that aspen trees all over the world shuddered when the nails were driven into the wood and the sacred blood gushed upon the cross, and have trembled ever since. A variation of this story states that Jesus Himself was forced to fashion His cross of aspen wood, and for this reason poplars are considered sacred in some lands.

Vol. 9, No. 2 MEMOIRS OF THE NEW YORK BOTANICAL GARDEN August 1, 1955

X-QK31 .M6

X-QK31.M6 #38

27 JAN 19

# PLANTS COLLECTED IN ECUADOR BY W. H. CAMP
# ERIOCAULACEAE, VERBENACEAE

HAROLD N. MOLDENKE

## ERIOCAULACEAE

**Eriocaulon microcephalum** H.B.K.

An alpine species found in scattered localities from Kern County, California, through the states of México, Puebla, Tamaulipas, and the Federal District, Mexico; and from the department of San José, Costa Rica, to Azuay, Carchi, Loja, and Pichincha, Ecuador, and Cajamarca, Cuzco, and Junín, Peru. *E-465, E-1681, E-2086, E-2582.*

**Paepalanthus ensifolius** (H.B.K.) Kunth.

A páramo species known from the high mountains of Cauca, Cundinamarca, Magdalena, and Sandanter Norte, Colombia; Azuay, Carchi, and Loja, Ecuador; and Amazonas, Peru. *E-402.*

**Syngonanthus yacuambensis** Moldenke.

*F. Prieto P. 197,* TYPE. The species is known only from the type collection.

## VERBENACEAE

**Aegiphila alba** Moldenke.

An Ecuadorean species known from Azuay, El Oro, Esmeraldas, Guayas, Los Ríos, and Pichincha. *E-3606.*

**Aegiphila bogotensis** var. **aequinoctialis** Moldenke.

*E. 4338* (TYPE), *E. 4388, E. 4419.* The species is known only from Azuay, but is apparently closely related to the rare *A. mortoni* Moldenke of Cuzco, Peru.

**Aegiphila chrysantha** Hayek.

A rather widespread species ranging from Chimborazo, Guayas, and Manabi, Ecuador, and Loreto, Peru, to Amazonas, Bahia, Maranhão, and Pernambuco, Brazil, and Santa Cruz, Bolivia. *E-3863.*

**Aegiphila ferruginea** Hayek & Spruce.

An Ecuadorean species known from Azuay, Carchi, Chimborazo, Imbabura, and Pichincha. *E-365, E-366, E-2211a.*

**Aegiphila integrifolia** (Jacq.) Jacks.

A very widespread and variable species ranging from Trinidad and the departments of Boyacá, Caquetá, Cauca, Chocó, Magdalena, Mêta, and Valle del Cauca, Colombia, and the states of Amazonas, Bolívar, and Zulia, Venezuela, through British Guiana and French Guiana, to Napo-Pastaza and Santiago-Zamora, Ecuador, and Cuzco, Huánuco, Junín, Loreto, Puno, and San Martín, Peru, eastward to Amazonas, Bahia, Mattogrosso, Minas Geraes, Pará, Rio de Janeiro, and São Paulo, Brazil, and south to El Beni, La Paz, and Santa Cruz, Bolivia. It is cultivated in Haiti.

**Aegiphila pendula** Moldenke.

Known thus far from the Panama Canal Zone, from the State of Zulia, Venezuela, and from Bolívar, Cañar, Chimborazo, Guayas, and Santiago-Zamora, Ecuador. *E-3827.*

X-QA31
.M6
3 - MAR 23
27 JAN 1956

# NATURE STUDY NOTES -- INSECTS I

## The Honeybee

Harold N. Moldenke,
Director, Trailside Museum
Union County Park Commission

The following notes are intended to accompany and to be supplementary to my illustrated lecture on the honeybee:

The Honeybee (Apis mellifica) is one of the most amazing animals on earth. A typical colony or "hive" consists in summer of between 50,000 and 100,000 individuals -- usually about 70,000. The number of individuals is less when the supply of nectar is scarce and is also much less in winter in the colder or temperate climates. It may dwindle to 10,000 at the end of a hard winter. In the wild state the honeybee makes its home in hollow trees, and it is for such trees in the forests that bears, skunks, and badgers search. Such trees are called "bee trees" or "honey trees".

There are very destructive insects on earth, and also very valuable ones. Often, when we categorically damn all insects, we forget the ones that are valuable to man and his economy. Practically all creatures, including insects, are valuable to Nature and have their distinct place in maintaining the Balance of Nature which, if too badly disrupted, would make life on earth impossible for us.

From the narrow point-of-view of man's economy, however, the honeybee is perhaps the most valuable of all insects. It gives us our entire honey crop. About 200,000,000 pounds of honey are marketed in the United States alone every year.[1]

But far more important than its honey crop is the work it does in pollinating flowers, enabling them to produce fruit and seed and propagate themselves. Some fifty different agricultural crops in America depend in major part on the services of the honeybee. Among these crops are apples, pears, peaches, plums, cherries, strawberries, raspberries, blueberries, quinces, avocados, apricots, grapes, oranges, lemons, limes, kumquats, pumpkins, squashes, cucumbers, peas, beans and buckwheat.

In every bee hive (except in winter) there are three types of bees, easily distinguishable with practice, by the naked eye: the workers, the drones and the queen. Workers and queens are female morphologically and drones are male. The workers, however, are stunted or undeveloped females, with undeveloped sexual organs, and so they are often referred to as sexless or neuter.

Since the stinging apparatus in the honeybee is a modification of or appendage to the female sex apparatus, it is obvious that only workers and queens are able to sting. In the workers the entire female sex apparatus is modified into the sting. Workers, therefore, usually can lay no eggs. (Phillips says that very rarely a worker can lay a few eggs that always develop into drones.) In the queen the sting is an appendage to the sex apparatus and therefore does not hinder her laying of eggs. In the workers the sting is retrorsely barbed (like an arrowhead) and cannot be withdrawn after being inserted into another body. The workers, therefore, can sting but once and then die. As they move or fly away after having stung another body, the sting remains in the other body and all the internal parts connected with it are pulled from

X-QK 31
S75

103
Dups
X-QK31.S75 #90

3
Copy
3
23
48

**Overdruk**

uit

**„De Tropische Natuur"**

**Jrg. 28, afl. 9, 1939**

# *Klimplantsluiers en plantendekens als typen van inzakkende vegetatie*

*door*

*C. G. G. J. van Steenis.*

#91

X-QK 31
.S75

3
Copy

3
23
48

QK31.S75 #91

**Overdruk**

uit

**„De Tropische Natuur"**

**Jrg. 29, afl. 10, 11-12-'40**

# *Vegetatieschetsen van het Idjen-Hoogland*

*1. Goenoeng Soeket; 2. Kawah Idjen en Merapi*

*door*

*C. G. G. J. van Steenis*

X-QK 31
.S75

**Overdruk**
uit
**„De Tropische Natuur"**
**Jrg. 29, afl. 5, 1940**

3
Copy
3
23
48
X-QK31.S75#92

# *Periodieke massabloei van Strobilanthes*

*door*

*C. G. G. J. van Steenis*

106

#93

X-QK 31
.S75

**Overdruk**

uit

**„De Tropische Natuur"**

**Jrg. 30, afl. 3, 1941**

3
Copy
3
23
48

X-QK 31 .S75 #93

# *Tabel voor de in Ned. Indië voorkomende ketjoeboengs en doornappels (Datura, Brugmansia, fam. Solanaceae)*

*door*

*C. G. G. J. van Steenis*

X-OK 31
.S75

**Overdruk**

uit

**„De Tropische Natuur"**

**Jrg. 30, afl. 12, 1941**

3
Copy
3
23
48

X-OK 31 .S75 #94

# *Rafflesia rochussenii in de Djampangs*

door

*C. G. G. J. van Steenis*

122

X-QK 31
.S75

**Overdruk**

uit

**„De Tropische Natuur"**

**Jrg. 30, afl. 10-11, 1941**

3
Copy
3
23
48

X-QK 31.S75 #95

# *Pilea peploides als slokanplant*

door

*C. G. G. J. van Steenis*

X-QK 31
.S75

3
Copy
3
23
48

X-QK 31.S75 #96

**Overdruk**

uit

**„De Tropische Natuur"**

**Jrg. 30, afl. 12, 1941**

# *Het veentje Rawa Gajonggong bij Tjibeureum boven Tjibodas (N. Gedeh)*

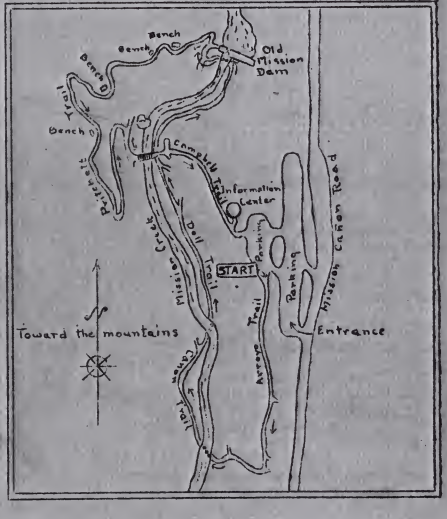
*door*

*C. G. G. J. van Steenis*

#97

X-QK73
.S2 #97

# GUIDE
to the
# NATURE TRAIL
of the
# SANTA BARBARA BOTANIC GARDEN



X-QL31
.S4
X-QL31.S4#98

*Boletín de la Sociedad española de Historia natural*, Enero, 1901.

# El Barón Edmundo de Sélys-Longchamps

baron, 1813-1900

(Noticia necrológica)

POR EL

R. P. LONGINOS NAVÁS.

Pérdida en extremo sensible acaba de experimentar nuestra Sociedad con la muerte del Barón Edmundo de Sélys-Longchamps, ocurrida en Lieja (Belgica), el día 11 del pasado Diciembre. Pocos personajes contará nuestra Sociedad de la talla de Sélys-Longchamps. Desde el año 1874 pertenecía á ella y la ennoblecía con su ilustre nombre, como honraba á la Sociedad Zoológica de Francia, que lo contaba entre sus miembros honorarios, y á la Entomológica de Bélgica, de que fué presidente. Además, muchas otras Corporaciones científicas se gloriaban de tener al finado Barón entre sus socios de número, correspondientes ú honorarios.

Durante más de medio siglo ha ocupado lugar preferente en el mundo sabio. Ya el año 1836 dióse á conocer por su *Essai monographique sur les Campagnols des environs de Liége*. Poco después, en 1840, publicó su famosa *Monographie des Libellulidées d'Europe*, obra fundamental para todos los que después han querido estudiar esta sección de los Neurópteros de Europa. Desde entonces, aunque no descuidó el cultivo de otros ramos de la Historia Natural, especialmente insectos Lepidópteros y Ortópteros, dedicóse por completo al estudio de los Odonatos, abarcando en su investigación á los de todo el mundo. De su fecunda pluma brotaron continuamente sabias monografías ó enumeraciones y descripciones aisladas, que serán siempre consultadas como oráculos por los que á semejantes estudios se dediquen. A él en gran parte se debe el rápido incremento que tomó el estudio de los Odonatos en diferentes naciones durante la segunda mitad del siglo que acaba de terminar. Su labor ha sido fructífera. En los albores de su carrera entomológica, en 1838, se conocían apenas 159 especies de

LIBRARY OF CONGRESS
462671
NOV 10 190
SMITHSONIAN DEPOSIT